THE IRON AGE

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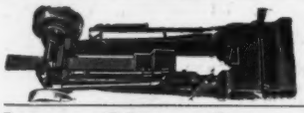

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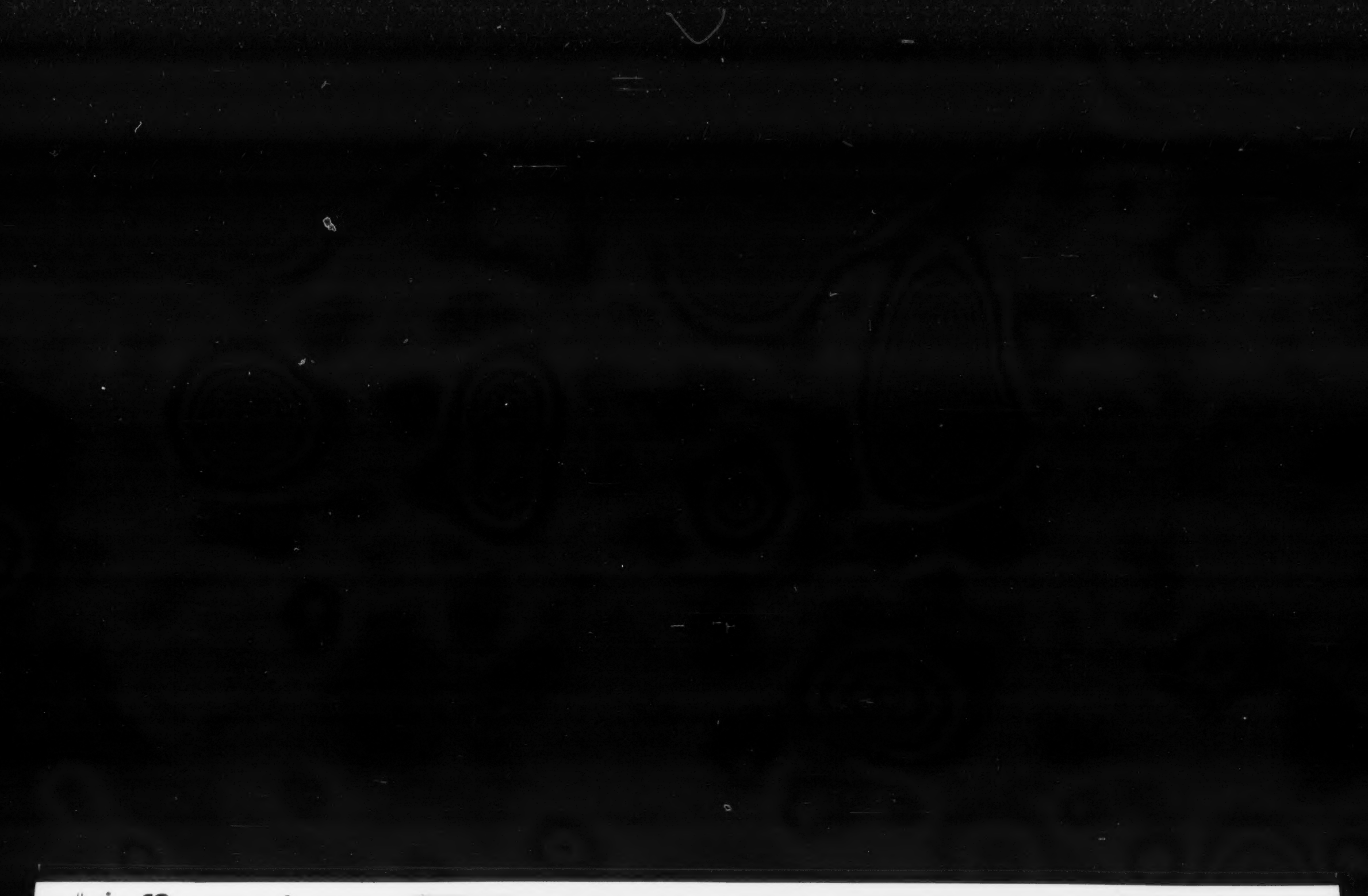


THE IRON AGE

New York, Thursday, August 22, 1907.

The Parsons Turbo-Blower for Blast Furnaces.

Description of an Installation at the Trzynietz Furnace Plant.

The first turbo-blower designed by C. A. Parsons was put in operation in 1904 at a Middlesbrough, England, furnace plant. Now 23 blowers are either in operation or are ordered for iron blast furnaces, cupolas, and copper and lead furnaces. The iron furnaces thus equipped are at the works of Sir B. Samuelson & Co., Ltd., Middlesbrough; Bengal Iron & Steel Company, India; Wilsons, Pease & Co., Ltd., Middlesbrough; Blaenavon Company, Ltd., Blaenavon, England; Walter Scott, Ltd., Leeds, England; James Dunlop & Co., Ltd., Glasgow, Scotland; Consett Iron Company, Ltd., Consett, England; Stafford Coal & Iron Company, Ltd., Stoke-on-Trent, England; EbbwVale Steel, Iron & Coal Company, Ltd., Ebbw-Vale, England; Wm. Sandford & Co., Australia, and Cammell, Laird & Co., Ltd., Sheffield, England. In 1905 an accident to one of the blowing engines at the Trzynietz Works of the Oesterreichische B. u. Ft. G. led to the placing at the Bruenn shops of an order for a Parsons turbo-blower. This machine is described and the results obtained with it are recorded in an article by the chief engineer, Julius Fuerstenau, in the *Zeitschrift des Vereines Deutscher Ingenieure*, from which we gather the following data:

The original blowing engines were horizontal compound condensing engines, each supplying a 150-ton furnace, at 30 rev. per min., with 15,642 cu. ft. of blast, and at the maximum of 45 revolutions with 23,410 cu. ft. at a pressure varying between 28 and 100 lb. per square inch. The turbo-blower called for 15,890 cu. ft. per minute, to be delivered under all circumstances, even at the high pressure. The revolutions fluctuate between 2400 and 3400 per minute.

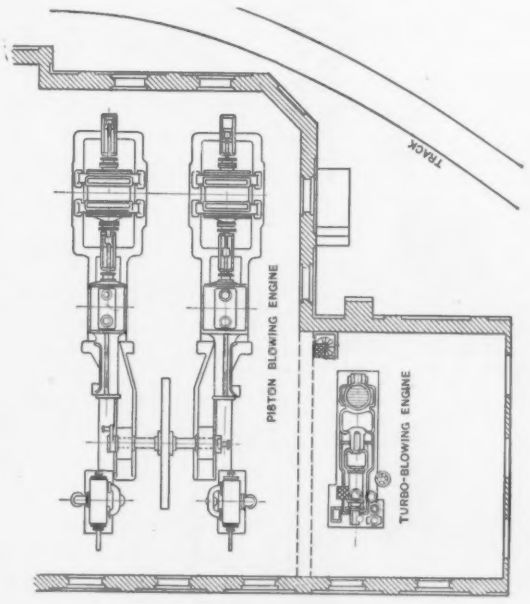


Fig. 1.—Plan of Blowing Engine House at Trzynietz.

Comparison of Space Occupied.

Fig. 1 shows a plan of the Trzynietz blowing engine house, and at a glance indicates strikingly the difference in floor space occupied. The piston blowing engine calls for an area of 75 ft. × 40 ft. = 3000 sq. ft., while the turbo-blower takes only 36 ft. × 16 ft. = 576 sq. ft., or less than one-fifth. The turbo-blower was placed on a cement floor, supported by beams without foundations, so that the condensing plant is conveniently placed below it. The natural consequence is that the cost of the turbo-blower is exactly one-half of that of the piston blowing engine.

The design of the Parsons turbine is too generally known to need description; it is only necessary to note the special method of governing called for by the considerable variations in the speed of the blower. The turbine must be controlled by its governor, Fig. 2, within the range of 2350 and 3400 revolutions.

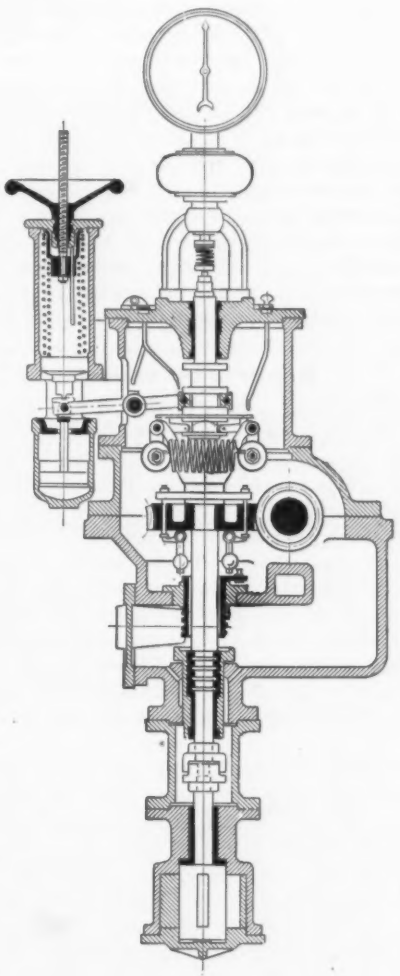


Fig. 2.—Governor.

The Governor.

By a worm gear the turbine shaft drives a vertical spindle, which is most carefully guided. This spindle bears a spring governor of the simplest design. Both of the ends of the cylindrical weights are connected by a screw spring. The governor case is driven by simple levers and rolls. The case carries two annular notches. In one there rests the lever connecting with the apparatus for adjusting the speed, and in the other is the lever for operating the steam valve. The apparatus for adjusting the speed is a spring balance, connected with an oil dash pot.

It will be observed that there is a second governor at the worm gear, which becomes operative only when the speed has gone beyond a predetermined limit. The weights then fly outward and turn a worm gear and thus cut off the steam, this being the safety governor common to all steam turbines. At the upper end of the governor

spindle there is a tachometer, while the lower end bears, through a coupling, the oil pump, designed in the form of a rotary piston pump.

The surface condensing plant consists of a wrought iron condenser, in which the cooling water flows through brass tubes; of a centrifugal pump, which is directly coupled to the starting motor, and of a piston air pump coupled with a warm water pump, which draws off the condensed water and delivers it to the boiler house. The two pumps last named are driven by belt.

Ease of Operation.

In order to do the work under all conditions, the dimensions of the steam turbine are so selected that it will operate without condensation. The exhaust pipe branches off immediately above the valve connecting with the condenser, and is cut off from the air by a valve held in position by the pressure against the vacuum. The latter valve opens automatically whenever for any reason the condenser fails. This happened repeatedly when the plant was started, once because the new belt stretched and at another time because the fuses of the starting motor burnt out. The exhaust was diverted without being noticed in the running of the blower. The gauge alone showed the loss of the vacuum and the increased load on the turbine. Since the turbine thus practically performs its own service, is automatically lubricated and adjusts itself to varying loads, nothing remains to be done by the engineer but to watch for the signals from the blast furnace in order to handle the wheel regulating the speed. The engineers who ran the reciprocating engines learned to handle the turbo-blower very quickly, although at first their attitude was one of great suspicion.

Details of the Blower.

The blower itself, shown in Figs. 3 and 4, consists of a series of ventilators, with many vanes placed side by side. They are mounted when heated on a shaft which is placed in two bearings of the Parsons type. At the end facing the turbine this shaft bears a clutch coupling. The axial thrust caused by the pressure of the blast on the vanes is counterbalanced by a piston on the spindle. As a matter of fact, a pressure of only a few pounds has been observed on the end bearing. The body of the blower consists of a cylindrical part which embraces the wheels, and of the simplest connections for the intake and delivery of the air. It embraces also both of the bearings. At the part nearest to the steam turbine the cylinder is shaped as a base plate for the latter, and it rests with a broad surface upon the concrete foundation. The part away from the steam turbine rests upon a sliding plate, so that it may freely expand when heated.

Since the blowing cylinder had to carry the blast pipe directly and was expected to work simultaneously with the reciprocating blowing engines, it was necessary to take pains to prevent the jarring of the blast main from affecting the blowing cylinder of the turbo-blower. Therefore a part of the blast main near the turbo-blower was made of cast iron and was firmly bolted to masonry. An effective expansion joint was also introduced into the main, devices which have proved completely satisfactory. The quiet working of the blower is a special advantage of the design, particularly since it was this fact which reassured the crew, who were nervous in view of the, to them, increasing speed of the engine.

The Efficiency Diagram.

So far as the operation of the turbo-blower is concerned, the volume of air delivered and the pressure vary with the speed. In Fig. 5 the abcissæ record the volume in cubic meters per minute and the ordinates the pressure in millimeters of quicksilver. The curves represent equal speeds. The dotted lines indicate curves of equal efficiency in per cent. The numerals are the plotted results obtained in actual practice.

A series of tests was made, the details of which are entered into in the original paper. The results are summarized in the following table for the turbo-blower, and

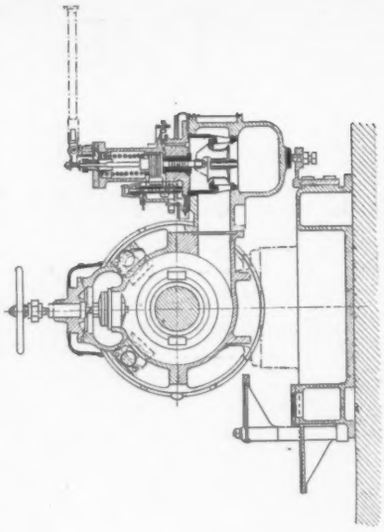


Fig. 4.—Section through *a b*, Fig. 2.

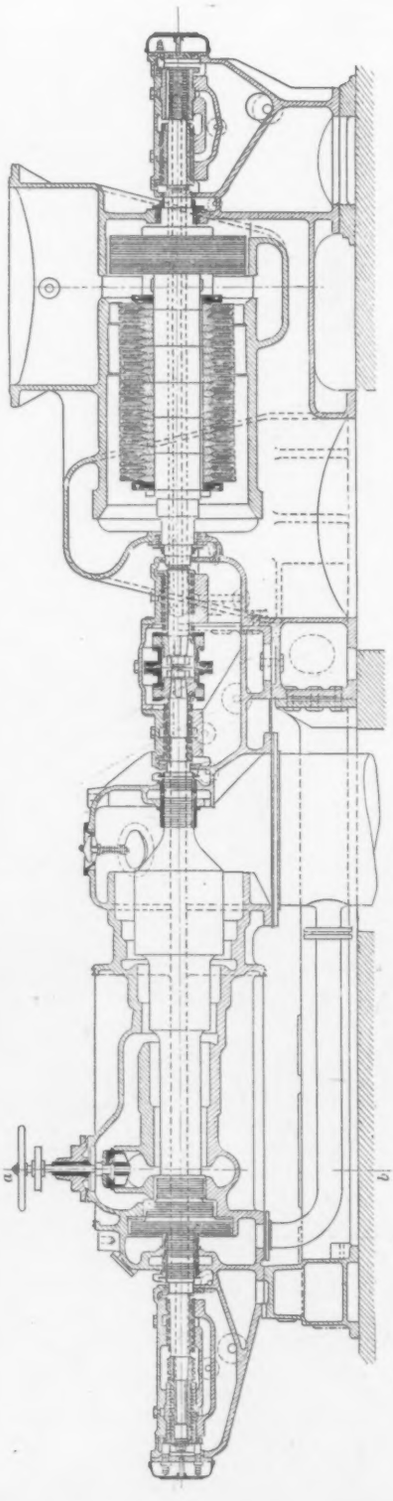


Fig. 3.—Section through Parsons Turbo-Blower.

THE PARSONS TURBO-BLOWER AT THE TRZYNIETZ FURNACE PLANT.

for blowing engines of approximately equal capacity at Trzynietz and at Hernadthal:

	Turbo-blower.	—Blowing engines.— Trzynietz.	Hernadthal.
Blast per minute, cubic meters..	578.65	540	557.6
Steam consumption per hour, kilograms	5,348.71	5,880	5,500
Steam consumption per minute, kilograms	89.5	97.8	92
Pressure, atmospheres	1.454	1.466	1.45
Consumption of steam per minute per 100 c. m. of air, kilograms	15.45	18.1	16.45

In substituting the turbo-blower for the reciprocity blowing engine at Trzynietz there has been a consider-

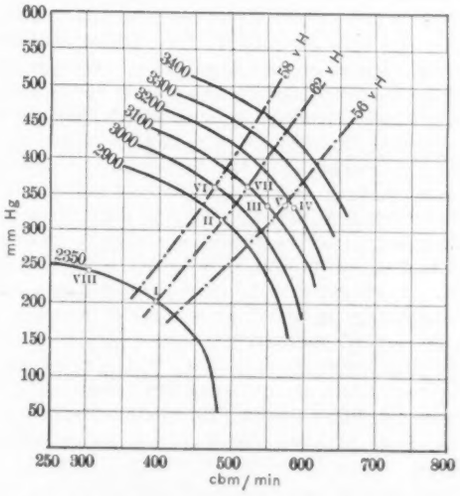


Fig. 5.—Efficiency Diagram of Turbo-Blower.

able economy of steam, it being 14.7 per cent. Taking into account the saving in first investment, in the consumption of oil and in cost of repairs, the turbo-blower is a paying machine.

The Mathews Portable Cylinder Boring Bar.

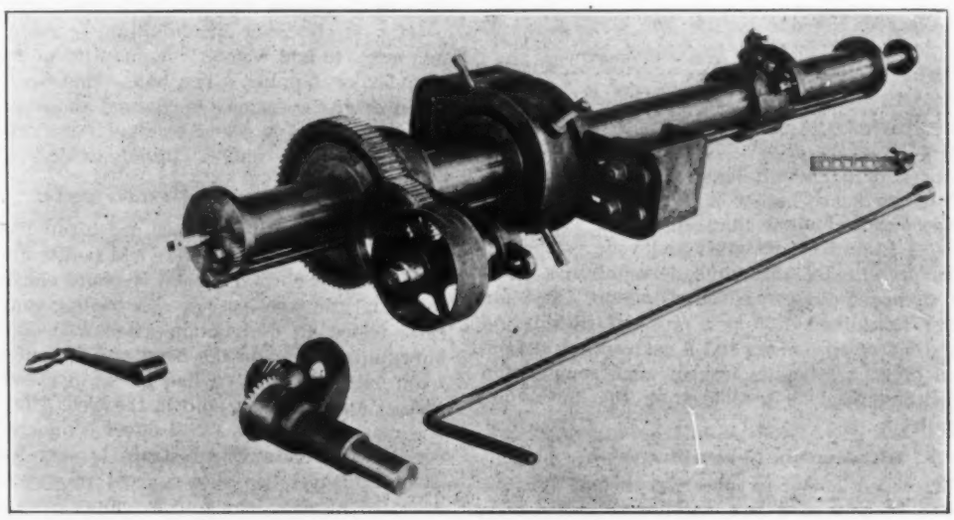
Those who have use for such a device are probably familiar with the portable cylinder boring bars now on the market. Since all are used in generally similar manner, the accompanying illustration of a new one made by Hugh Mathews, Fifth and Washington streets, Kansas City, Mo., showing it with its attachments, is substantially self-explanatory. It is intended for reboring cylinders for all kinds of steam, gas, hydraulic and pneumatic machinery and the hubs of flywheels and pulleys, which are of such size as to make it more convenient to bring the tool to the work rather than the work to the tool. This one is claimed to be the most complete device of the kind yet produced capable of as high a degree of accuracy and convenience.

The bar is a hollow steel tube, turned and ground to size. The tool head is so arranged that the tool can be fed out and the back counterbore of a cylinder can be rebored without changing the bearings of the bar. It is also possible to face a joint or flange of the cylinder without putting any cumbersome attachments on the bar—a feature which will be found particularly convenient on pump repairs. The feed gears and screws are of steel and the feed nut of bronze.

The tool is driven by hand with a crank or by power through a belt or sprocket chain, and the drive is transmitted through cut gears to the bar proper. When boring vertical cylinders or horizontal cylinders where the situation is such as to make it desirable, a right-angle drive is used, shown in the foreground in the engraving. The latter also shows all of the attachments used with the bar for boring cylinders with one head removed. An additional cross plate and bearing is also furnished for boring cylinders when both heads are removed. Each bar has two tool holders with two self-hardening steel tools. The bars are made in sizes to bore cylinders up to 72 in. in diameter, and larger sizes are built to order.

A Refuse Burning Test.—In a 6-hr. test of the refuse burning plant which is used for lighting the Williamsburg Bridge, New York, the total refuse burned was 40,497 lb., or 6749 lb. per hour. The volume of the quantity burned was 293 cu. yd., and the weight 138 lb. per yard. It was burned under two Stirling water tube boilers of 200 hp. each. The total grate area is 192.5 sq. ft., and the consumption was at the rate of 39.2 lb. of refuse per hour on each unit of surface. The heating surface of the two boilers amounts to 3780 sq. ft., and the steam pressure during the test was 143 lb. per square inch. For each pound of refuse burned, 2.29 lb. of water were evaporated, from and at 212 degrees, this result being attributed in large measure to the economizers on the boilers. The consumption per kilowatt-hour was 46 lb., due to the fact that while the boilers were run at their full capacity, only a part of the power so produced was utilized in the generation of current.

The Jones & Laughlin Steel Company, Pittsburgh, has been exonerated by a coroner's jury in the cases of five men killed by the explosion of a dust catcher at one of the Eliza furnaces May 11. The jury returned a verdict of accidental death. Eugene Messler, general superintendent of the furnaces, testified that the downcomer pipes and dust catcher had been inspected a short time before the explosion and were found to be in good shape. He was at a loss to explain the cause of the unusual accident, other than that at the time of a slip, a few days prior to the dust catcher explosion, a quantity of ore and stone had been thrown from the top of the furnace and possibly loosened one or two rivets, and the pressure from within had loosened others. Several experts testified that the accident could not have been avoided.



The New Portable Cylinder Boring Bar Made by Hugh Mathews, Kansas City, Mo.

Chromium, Nickel and Cobalt in Pig Iron.

Treatment Resulting in High Class Steel.

A paper describing a method of treating pig iron containing chromium, nickel and cobalt, so as to overcome difficulties heretofore attending the manufacture of steel from such iron, was read before the May meeting of the Iron and Steel Institute at London, England, by Arthur Windsor Richards. Special interest attaches to it in view of the successful outcome of the Pennsylvania Steel Company's experiments in making steel from pig iron containing chromium. This element was carried into the pig from the iron ores in the Mayari District of Cuba, as recounted in the article in *The Iron Age* of August 15. As more will be heard of the new Cuban ores in connection with the manufacture of rails and other steel products by the Pennsylvania Steel Company, the parallel operations carried on in England for the treatment of pig iron containing chromium and nickel are instructive and Mr. Richards' paper is therefore given herewith:

Nickel Steel of Low Nickel Content.

Since James Riley read his invaluable paper on his researches on nickel-steel before the Iron and Steel Institute in 1889, alloys of iron and nickel have been adopted largely for special purposes, but their rather high cost has acted as a deterrent to their general use. American engineers, however, with their usual acumen, have brought nickel-steel into far wider use than Europeans. Judging from the great amount of literature on the subject, it is admitted that unless a minimum of 3 per cent. nickel is present in the steel very little, if any, benefit is derived, and nickel-steel almost always contains from 3 to 4½ per cent.

At the works of Bolckow, Vaughan & Co., Ltd., a process invented by Dr. Otto Massenez of Wiesbaden has been developed for the utilization of a peculiar quality of pig iron, by which a steel is produced containing approximately 1.5 per cent. of nickel with 0.25 per cent. of cobalt, and 0.30 per cent. of chromium, which possesses all the good properties of steel containing a much higher content of nickel alone, is much cheaper and very trustworthy.

The iron referred to is produced from iron ore, containing nickel, cobalt and chromium, an analysis of which follows:

	Per cent
Iron as received	45.69
Manganese	0.232
Chromium	2.35
Nickel } Cobalt }	0.90
Silica	12.32
Alumina	9.25
Lime	0.550
Magnesia	2.143
Sulphur	0.029
Phosphorus	0.02

Some of the ores are higher in nickel and iron and lower in silica and alumina than shown in the above analysis. As it is difficult to smelt and very refractory owing to the presence of chromium, it requires a large quantity of coke and limestone for reduction. The pig iron produced contained 1.75 per cent. of nickel and cobalt, 4 per cent. of chromium and 4 per cent. of silicon. The problem of converting an iron of such composition into steel, without serious trouble from the chromium, was a difficult one.

Eliminating Chromium.

Doctor Massenez, however, conceived the idea that if the iron were worked in a basic or neutral lined open hearth furnace provided with slag notches the chromium might be removed by forming successive voluminous quantities of oxidizing slags, and as the chromic oxide was formed, removing these slags through the slag notches before they became too thick. The process based on Doctor Massenez's idea was worked out at the Cleveland Works by the author and after many disappointments was finally successful, with the result that the greater part of the chromium was eliminated, but all the nickel and cobalt was retained in the steel.

Before adopting the open hearth furnace experiments were first made in an acid Bessemer converter to determine whether chromium could be removed therein, but it was found that when only 0.4 per cent. was present in the metal it was impossible to convert it owing to the extremely thick slag produced by the chromic oxide. Fluorspar was added, but this formed foamy slag and caused waste by blowing out. No better success was achieved by blowing the iron in a basic Bessemer converter.

The following is a detailed description of the process as at present conducted:

Into an open hearth furnace is charged 3 tons each of lime and basic slag, the latter produced by melting hematite pig iron in a basic hearth, and over this is added 3 tons of hematite iron ore. The mixture is heated until the ore becomes pasty. Two ladles containing 10 to 11 tons each of chrome-nickel iron, previously melted in a cupola, or taken direct from a blast furnace, are then poured into the furnace. It was found that the process was much facilitated by using molten iron instead of cold pig, for the reason that the latter has a high melting point, and boiling commences before the pigs are all melted. Thick and foaming slag is gradually formed, containing a portion of the chromium as chromic oxide, and this at the end of 45 min. to 1 hr. is run out at the slag notches. A second slag is then formed from the materials remaining on the bottom of the furnace hearth, which do not all melt at first, and by further additions of basic slag, fluorspar and lime. This slag after melting contains an additional quantity of chromic oxide and is also removed, but owing to its viscous character it can only be made to pass the slag notches by mechanical assistance. This operation of forming slag is repeated according to the percentage of chromium in the iron. When working with an iron containing 4 per cent. of chromium it is generally found necessary to make and run out of the furnace four such slags, after which practically the whole of the chromium is removed. When this point is reached the metal is worked like an ordinary open hearth charge. The resulting steel contains about 0.3 per cent. of chromium, as it derives some of this during the decarburizing period in the open hearth, being reduced from the chromic oxide in the slag. In making high carbon steel it has been found desirable to run out the charge when the required carbon has fallen to the required point, but, failing this, the recarburization is either done in the furnace or in the ladle, by the usual additions. The pig iron experimented upon contained 0.3 per cent. of sulphur, but this was easily removed by continuous feeding of the bath with fluorspar.

If a steel higher in chromium is required it is only necessary to add a sufficient quantity of the chromic pig iron before tapping. The boil commences in from 9 to 10 hr. after the furnace is charged and only lasts an hour before the steel is ready for tapping. The slags contain from 5 to 10 per cent. of chromic oxide.

The Steel Under Tests.

At the end of this paper are given mechanical tests on the steel produced. The yield points are much higher than those of normal carbon steels of similar carbon content, and the steel possesses exceeding toughness. Tram rails tested to destruction after withstanding repeated blows alternately on the head and foot of each rail by a 1-ton ball falling 25 ft. had pieces of the flange torn out and, at another blow, split in the web, after which it took one more blow at 25 ft. to effect complete fracture. Its resistance to reversal of strain is very marked. In all cases the steel has shown great improvement by being reheated after finishing to a temperature of 650 degrees C. and cooling in air. In this heat treatment it is not soaked, but as soon as it attains 650 degrees evenly throughout the mass it is removed from the furnace.

The steel has been put to numerous uses at the works of Bolckow, Vaughan & Co., Ltd., in every case with great advantage. For instance, much trouble was found with the tram roughing cast iron grain rolls, which frequently broke owing to their length between the housings and the deep cuts necessary to obtain wide flanges in the rail. The rolls, when made of this special steel, outlasted

very many grain rolls and required less frequent dressing in the lathe. Blooming mill screws of this material do not seize and break, as such screws did when made of ordinary steel. It has been found to be particularly useful in shafts, axles, &c.

In conclusion, it must be admitted that the alloys, containing about 1.50 per cent. of nickel, 0.25 per cent. of cobalt and 0.3 per cent. of chromium, with carbon varying between 0.50 to 0.70 per cent., have peculiar resisting properties to mechanical shocks and stresses and should find a wide field of usefulness for engine parts, motor car construction, &c. The process is, so far as is known, the only one suitable for the treatment of chromiferous pig iron.

TRAM RAILS.—92½ LBS. PER YARD.

Analyses.

Cast No.	C.	Mn.	Si.	S.	P.	Ni.	Cr.	Co.
1	0.58	0.66	0.02	0.048	0.022	1.51	0.51	0.25
2	0.53	0.86	0.02	0.057	0.032	1.45	0.30	0.23
3	0.52	0.57	0.02	0.06	0.027	1.39	0.35	0.24
4	0.56	0.96	0.02	0.06	0.03	1.50	0.30	0.26

Tensile Tests.

Cast No.	Yield point. tons per square inch.	Ultimate stress, tons per square inch.	Elongation, per cent. in 2 in.	Contraction of area, per cent.
1	32.10	57.90	13.00	26.50
2	33.60	54.50	13.00	22.50
3	29.50	57.20	12.00	20.50
4	33.80	60.00	12.50	20.70
4*	33.40	58.40	19.00	32.70

* Reheated to 650 degrees C.

Impact Tests on 5 ft. Lengths.

Ball falling 25 ft. Weight of ball, 2,240 lb. Supports apart, 3 ft.

Cast No.	Deflection in inches. 1	2	3	4	5	6	Remarks.
		Rev.		Rev.		Rev.	
1	1 11/16	11/16	1 9/16	15/16	Broke.	..	Web collapsed at fourth blow.
2	1⅞	11/16	1 11/16	15/16	1⅝	1⅛	Broke; web collapsed at sixth blow.
3	1 13/16	11/16	1	1	2	1½	Broke; web collapsed at sixth blow.
4	1 11/16	11/16	1 9/16	1⅛	1 13/16	2½	Web and lip curled and buckled at sixth blow.

Rev. = reversed.

BULLHEAD RAILS.—91¼ LB. PER YARD.

Analyses.

Cast No.	C	Mn.	Si.	S.	P.	Ni.	Cr.	Co.
5	0.60	0.71	0.015	0.06	0.018	1.51	0.12	0.26
6	0.67	0.61	0.015	0.059	0.02	1.40	0.36	0.25
7	0.65	0.65	0.02	0.059	0.02	1.43	0.36	0.25
8	0.69	0.77	0.01	0.06	0.016	1.44	0.20	0.26

Tensile Tests.

Cast No.	Yield point. tons per square inch.	Ultimate stress, tons per square inch.	Elongation, per cent. in 2 in.	Contraction of area, per cent.
5	33.20	53.10	16.00	19.70
6	33.40	53.90	15.00	21.80
7	33.20	51.40	16.00	21.80
8	33.10	55.30	14.00	19.80
8*	33.80	53.30	25.00	38.80

* Reheated to 650 degrees C.

Impact Tests on 5 ft. Lengths.

Ball falling 20 ft. Weight of ball, 2,240 lb. Supports apart, 3 ft. 6 in. Deflection in inches.

Cast No.	1	2	3	4	5	6	Remarks.
5	2¾	5¼	1 1/16 Rev.	2⅞	1 Rev.	3¼	Broke at eighth blow.
6	2⅛	3⅞	5⅝	Broke.	..	..	Broke at fourth blow.
7	2⅝	5	7¼	9¾	..	..	.....
8	2 5/16	4¼	6⅞	..	..	..	.....

Rev. = reversed.

Reversal of Strain Tests.

Description of steel.	Diameter of test piece. Millimeter.	Stress in tons.	Revs. per min.	Total revs. to fracture.	Comparative value. Ord.=1.
1. Carbon steel	1.00	20	1,200	77,330	1.0000
2. Silicon steel	1.00	20	1,200	100,175	1.2958
3. Nickel cobalt-chrome steel	1.00	20	1,200	210,910	2.9560

Effect of Heat Treatment on No. 3.

Description.	Diameter of test piece. Millimeter.	Stress in tons.	Revs. per min.	Total revs. to fracture.
Normal	1.00	20	1,200	210,910
Reheated to 500° C.	1.00	20	1,200	296,990
Reheated to 650° C.	1.00	20	1,200	577,320
Reheated to 750° C.	1.00	20	1,200	341,600
Reheated to 850° C.	1.00	20	1,200	296,455
Reheated to 900° C.	1.00	20	1,200	242,275

Analyses of Steels Used for Comparison.

	C.	Mn.	Si.	S.	P.	Ni.	Co.	Cr.
Carbon steel	0.46	1.13	0.056	0.065	0.063	...	...	...
Silicon steel	0.45	1.10	0.238	0.060	0.050	...	...	...
Nickel chrome steel	0.47	0.93	0.010	0.050	0.010	1.41	0.25	0.32

Protective Coatings for Iron and Steel.

At the Engineering Conference of the Institution of Civil Engineers held in London in June, Bertram Blount read a brief paper on "The Best Means of Preserving Iron and Steel Work in Railroad Construction." He considered a bituminous preparation the best preservative for iron and steel work exposed to the weather. Natural bitumen is very permanent, but rather costly; coal tar, properly boiled so that the coating shall be neither brittle nor sticky, is almost as durable and is cheap enough. Its use is limited by æsthetic considerations. Where the work is exposed to boiler gases, overhead bridges and station roofs, complete coating with a good layer of hot bitumen has so much practical advantage over paint that no question of appearance should be permitted consideration. For railroad structural steel work, such as the frames of buildings or frame foundations, the author considered no preservative so good as lime or cement concrete. This applies whether the steel framing is bedded in concrete, or whether it forms an integral part of the concrete, as in the various ferro-concrete systems. It is essential that the concrete should be dense and rich in cement, and that the cement, or lime, should be unexceptionable. Steel protected in this way need not first be cleaned from scale and rust.

In the discussion of the paper one speaker described experiments made with 14 or 15 samples of paints, all put on by the makers themselves. The prices varied between 88 shillings and 15 shillings per cwt., and the cheapest was quite as good as the dearest. Only two of the paints caught hold of the metal, and could not be peeled off. These paints, which contained an unknown ingredient, were sent to a chemist for analysis, but the chemist could not find out what it was, but only that it was not injurious. An engineer of the Midland Railway said that coal tar had done much mischief, as it contained an acid. As to paints, it is the oil that requires most consideration. Much more injury than is generally recognized is done to rails by corrosion in tunnels and in towns outside of them. He had known as much as 55 per cent. to take place in flange rails. Another speaker classed pigments thus: First, red lead; second, graphite; third, oxide of iron. He used red lead, long ground, with 10 per cent. raw linseed oil, and diluted with boiled oil to weigh 30 lb. to 40 lb. per gallon, no driers or turpentine to be added.

Dunnite, a new explosive, invented by Major Dunn, of the Ordnance Corps, U. S. A., is said to be more powerful than shimose, the explosive with which the Japanese did such terrific execution in the naval battles off Port Arthur and Vladivostock and in the Sea of Japan. Shimose, ordnance officers say, is a compound of picric acid, the secret of which is known to the ordnance officers of all the first-class powers. On the other hand, the secret of dunnite is in the exclusive possession of the United States Government. In recent tests of dunnite at Sandy Hook it is said that the very best 5 and 6 in. armor plates that could be obtained were used as targets. The result of every shot was the same. The armor plate was smashed into thousands of small pieces by the impact. Penetration is not necessary, the impact being such that the armor is shattered into countless pieces.

Coke Oven Gas Power in Germany.

A Central Electric Station with 4500 Hp.

BY P. EYERMANN.

The Eschweiler Bergwerks Verein, one of the large producers of coal and coke in the Rhine Provinces, installed recently at its mine Anna II an electric central station, which has demonstrated that coke oven gas can be used with great advantage for operating gas engines. The engines were built by the famous Nurnberger Maschinenfabrik. Fig. 1 shows a ground plan to scale of the entire plant, and Fig. 2 is a view in the engine house. On the ground plan 1 and 2 are engines of 500 hp. each making 125 rev. per min., while 3, 4 and 5 are engines of 1200 hp. each, with 100 revolutions. They are direct connected to alternators, and the three larger ones have especially heavy flywheels. The air, gas and exhaust are provided for by very large reservoirs and pipes, which are dotted to scale in the plan view also. The engines are arranged with all alternators on one center line. The building, which has ample hight, is 89 x 203 ft.

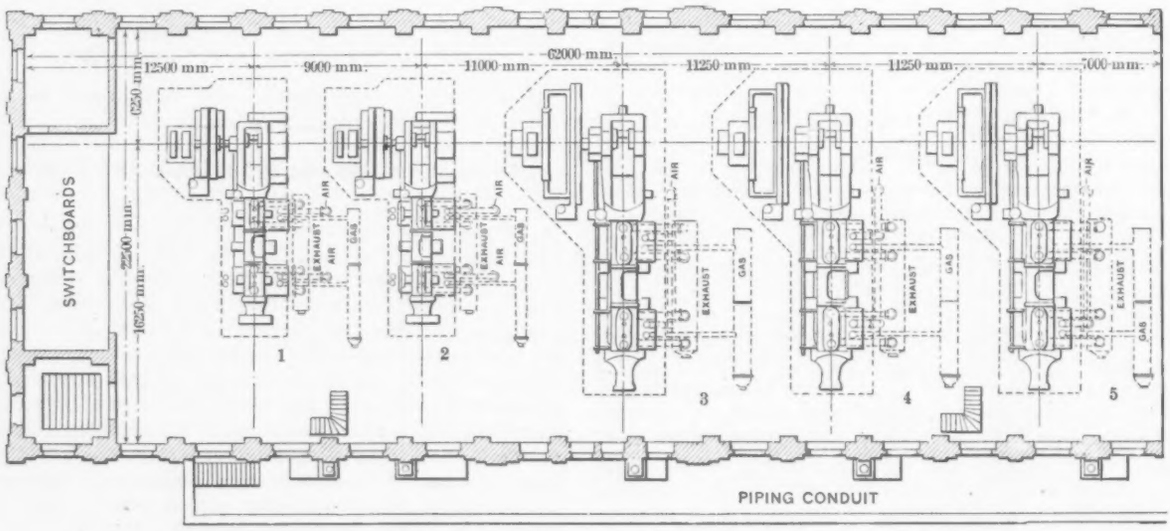


Fig. 1.—Plan of the Central Electric Station of the Eschweiler Bergwerks Verein.

Concerning the coke oven gas, I have received from the above company the following interesting facts: The heating value averages 3000 calories, or approximately 400 B.t.u. per cubic foot. Gas of this kind, according to various analyses, runs from 300 to 600 B.t.u. Each oven has a capacity of 15,800 lb. of soft coal, and the coking process requires 30 hr. In this period there is given off from one oven about 800 c. cm., or approximately 28,240 cu. ft. of surplus gas. Thus each hour there are available 27 c. cm., or about 942 cu. ft. of gas. Working under ordinary loads the engines take about 21 cu. ft. of coke oven gas per horsepower hour, and 45 hp. is thus approximately the result obtained per hour per oven. The plant at which these engines are running secures from 100 to 105 coke ovens about 4500 hp. Each oven turns out from the above mentioned 15,800-lb. charge approximately 5½ metric tons or 12,100 lb. of coke in 30 hr., or about 404 lb. of coke per hour per oven. The chemical composition of the average of coke oven gas is as follows:

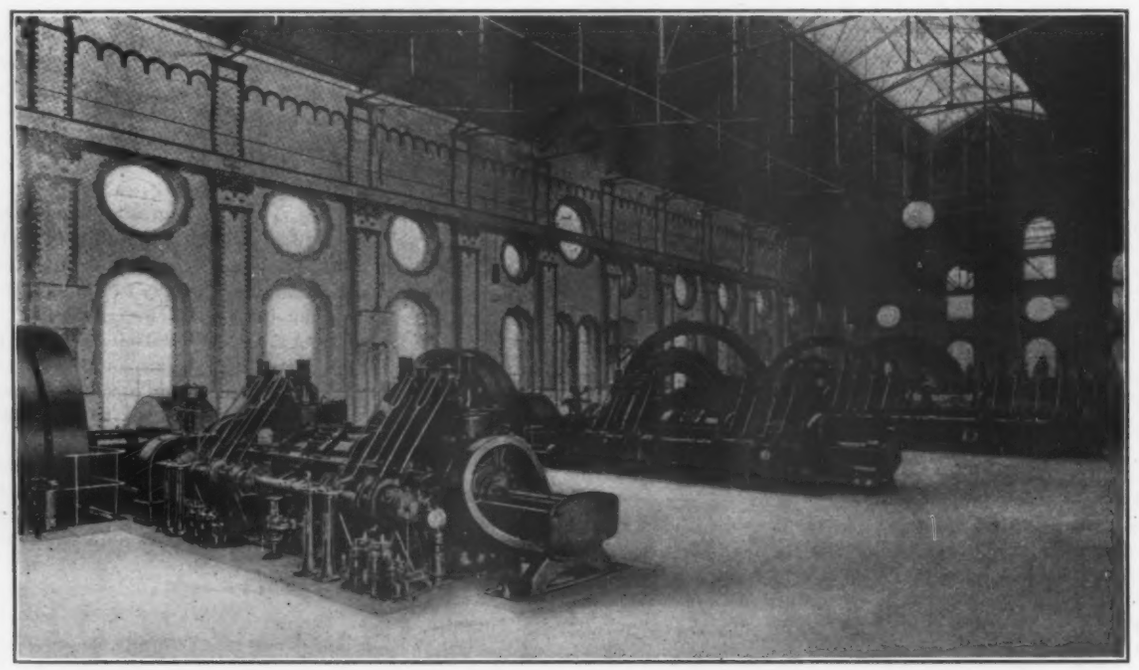


Fig. 2.—Interior of Power House, Showing Nurnberg Engines Which Are Driven by Coke Oven Gas.

	Per cent.
H	55
CH_4	32
C_2H_4	1.5
CO	7.0
CO_2	1.5
H_2O	1.0
CnHm	0.5
N	1.5
Total	100.0

The usual estimate of the amount of coke oven gas

given off per ton of coke produced is from 8000 to 9000 cu. ft. The results at the Eschweiler power station, as given above, demonstrate, therefore, that an up to date coke oven plant with a practical system of by-product recovery gives off sufficient gas to permit of the use of 60 per cent. for power purposes; in other words, the conversion of that much gas into money.

The Pope Mfg. Company Fails.

Because of its inability to obtain necessary accommodations from the banks in the various States in which it operates, the Pope Mfg. Company was placed in the hands of a receiver August 14. The initial application for the receivership was made in the United States Circuit Court in Newark, as the company was incorporated in New Jersey. Although the application was presented by the MacManus-Kelly Company, of Toledo, Ohio, as creditor to the extent of $4,306.30, the company itself was instrumental in the preparation of the petition, as it realized that it could not settle its own liabilities and those of its subsidiary, the Pope Motor Car Company, without making preferential payments. As these companies have total assets of $10,750,000 and liabilities of only $2,900,000, it is believed that the business will be continued as soon as the creditors have been paid.

Albert L. Pope, a son of Colonel Albert A. Pope, the president of the Pope Mfg. Company, and vice-president of that corporation, was appointed receiver for the company in the States of Connecticut, Maryland, Massachusetts, New York, Ohio and Illinois, and, with A. A. Tomblyn, of Newark, was also appointed receiver for the company in New Jersey.

Present Conditions.

Judge Case, in the Superior Court in Hartford, Conn., specified in his order that the receiver may conduct the business and contract for the sale and delivery of automobiles, bicycles and their accessories to such an extent as in his judgment may be advisable and until further order of the court. The receiver is permitted to discount notes and to borrow money to an amount not exceeding at any one time $50,000. It also was ordered by the court that notice of the temporary appointment be given to all parties at interest on or before August 21, such notice also to inclose a notice of a hearing to be held on August 28 in Hartford.

Counsel for the receiver has issued a statement which says in part: "One of the reasons why the company was hard pressed for ready money lay in the strike of its workmen in the Toledo plant of the Pope Motor Car Company, which occurred last spring. As a result of this strike, a large number of this year's motor cars which had been ordered last year were not finished on time and, as a consequence could not be sold when they were completed as the purchasers were unwilling to wait for late deliveries. Some of the company's statements show that fully $4,000,000 worth of automobiles were thus tied up. If the company could have obtained even $800,000 from these vehicles at this time, the present difficulty might have been obviated. The appointment of receivers, however, will enable the company to dispose of these cars and pay off some $1,600,000 in notes which it now is unable to renew."

The Company's Recent History.

The Pope Mfg. Co. was formed in February, 1903, as a reorganization of the American Bicycle Company and the American Cycle Mfg. Company, in which Colonel Albert A. Pope became interested after he had consolidated in these two companies his prosperous Pope Mfg. Company, which was then engaged in the manufacture of bicycles. The American Bicycle Company and its subsidiary, the American Cycle Mfg. Company, went into the hands of a receiver in September, 1902, and the greater part of the property was purchased by the reorganization committee, which formed the Pope Mfg. Company. The Pope Motor Car Company, originally, was incorporated as the International Motor Car Company and was then owned by the American Bicycle Company. It subsequently was acquired by the Pope Mfg. Company.

The Pope Mfg. Company had a total authorized capital of $22,500,000, of which $10,000,000 was in common, $2,500,000 in first preferred and $10,000,000 in second preferred stock. All of the common stock was outstanding and $2,390,976 of the first preferred and $8,633,100 of the second preferrd stock were held by investors. Though the parent corporation's principal subsidiary was the Pope Motor Car Company, it also had constituent companies known as the Federal Mfg. Company, a New Jersey corporation; the Columbia Steel Company, a Connecticut corporation, and a small company known as the Pope Mfg. Company of California.

The Company's Plants and Officers.

The plants of the Pope Mfg. Company are the Hartford factory in Hartford, Conn., the Westfield factory in Westfield, Mass., the Hagerstown factory in Hagerstown, Md., and the Crescent, Rambler and Imperial factories in Chicago. The Pope Motor Car Company plants are the Toledo factory in Toledo and the Waverly factory in Indianapolis.

The officers of the Pope Mfg. Company are: Albert A. Pope, president; Albert L. Pope, vice-president; Charles E. Walker, second vice-president; George Pope, treasurer; Wilbur C. Walker, secretary; and J. P. Fogarty, purchasing agent. Its directors include, besides the above mentioned officers, William A. Read, Colgate Hoyt, F. S. Smithers, George F. Crane, all of New York City; Arthur W. Pope, of Boston, and Paul Walton, of Ridgewood, N. J.

Colonel Albert A. Pope, the president of the Pope Mfg. Company, has been a leading figure in the manufacture and promotion of bicycles and as an advocate of good roads for many years. Recently he had not been very active in the management of the automobile company, and the greater part of the active management had fallen upon his son, Albert L. Pope.

A New Danger to Car Axles.

The number of railroad cars in the United States lighted by electricity generated by a dynamo driven by belt or chain from one of the axles is increasing. According to the *Electrical Review*, although it is generally understood to be poor practice to drill holes in the car axle when applying such equipment, the positive danger of doing so is apparently not recognized. It is well known that a drilled hole will prevent the spreading of an incipient crack, and is often employed for that purpose, but it is not so well known that sometimes a crack will be started by a drilled hole. Cracks may be expected to appear in any material subject to alternating stresses, at places where there is an abrupt change of section, or where a notch or groove has been made by a cutting tool in a turned surface.

Locomotive engineers have for years recognized the importance of these details and their influence on the life of both cranked and plain axles. In two car axles recently fractured the break occurred through the center of shallow drilled holes, the first after running 15,380 miles and the second after 13,900 miles. The diameter of the axle at the fracture was in each case 3¼ in. The cracks occurred several inches from the keyseats, and at points where the stress would not be a maximum. The drilled hole was made to receive the point of a set screw to prevent endwise motion of a chain wheel. The lesson taught from these two cases has resulted in the use of pairs of clamped plates gripping the axle and bolted to one another, in place of the set screws. Shafts or axles which have been drilled for set screws or other purposes should be carefully inspected periodically, to disclose the presence of cracks as soon as they appear.

The capital stock and business of the A. Carpenter & Sons Foundry Company, Providence, R. I., have been acquired by the General Fire Extinguisher Company, and the former was on July 1 merged into the business of the latter and will hereafter be known as the "Providence Foundry Department" and will be managed by Henry A. Carpenter, formerly president and treasurer of the foundry company.

Kirkwood Oil Burning Furnaces.

An Installation at the Fort Wayne Shops of the Pennsylvania Lines West.

Just how satisfactorily fuel oil may be used in place of coal for all shop purposes other than power is attested in the Fort Wayne Shops of the Pennsylvania Lines West of Pittsburgh. Nearly all that there is to tell is told by the layout given in Fig. 1, but it has been thought of likely interest to give some idea of what an actual equipment of oil burning furnaces consists in. As may be seen from the plan the equipment, all of which was furnished by Tate, Jones & Co., Pittsburgh, Pa., includes seven No. 1 forging furnaces for heating material up to 2 in. square for bolt machines, &c.; two No. 2 or larger size forging machines for heating material up to 4 in. square for large bolts, &c., one case hardening furnace the inside dimensions of which are 5 x 2½ ft. and 2 ft. 9 in. high; one steam hammer furnace having a hearth 3 x 4 ft. and one flue welding furnace. All of these are equipped with the Kirkwood combination oil burner, an outside and a sectional view of which are given in Figs. 2 and 3.

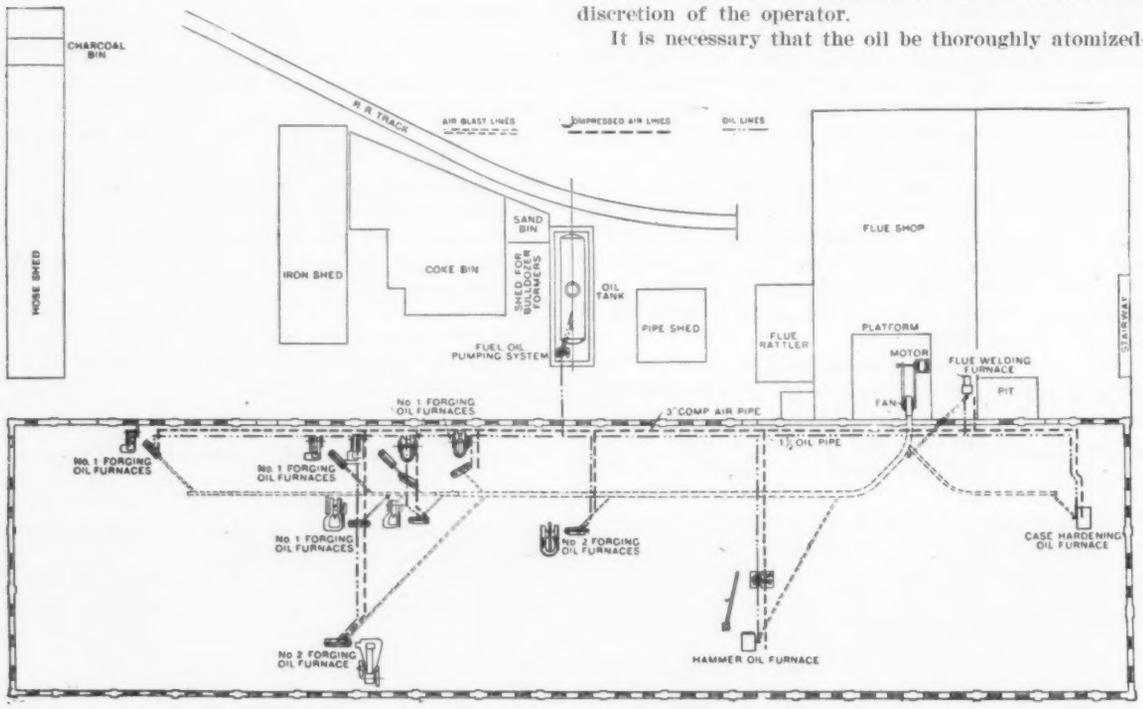


Fig. 1.—Arrangement of Oil Burning Furnaces and Compressed Air, Oil and Air Blast Lines at the Fort Wayne Shops of the Pennsylvania Lines West.

From the oil tanks the fuel oil is drawn and fed to these burners through oil pipes shown by dash and dot lines, the distribution being effected by a No. 1 pumping and regulating system, an illustrated description of which was given in *The Iron Age* January 17, 1907. The apparatus at the base of this system is housed in the same building with the oil tank and is designed to effect the conditions which are necessary to maintain efficient oil fires, namely, the feeding of the oil to the burners under a continuously uniform pressure, the heating of the oil before it enters the burner and the straining of it so that it will be free from lumps and foreign substances.

The small quantity of compressed air required for atomizing is taken from the shop compressed air supply and is reduced by a Foster reducing valve to 15 lb., at which pressure it is distributed to the burners by the piping system shown by heavy broken lines in Fig. 1. In this particular installation the amount of compressed air available beyond the other demands upon it was small, but as the oil burning system only requires 40 cu. ft. of free air compressed to 15 lb. for atomizing each gallon of oil, the effect of the 24 burners on the compressor, it is stated, has not been felt.

The air blast for combustion is provided by a No. 10 Sturtevant blower located on a platform in the flue shop, and driven by a 30-hp. 220-volt Type S Westinghouse direct-current motor, which is mounted on the same bed plate with the fan and is connected by countershaft and belts. The air from this blower is conducted at about 4 oz. pressure, through galvanized sheet iron pipes, shown in light dash lines in Fig. 1, to each of the burners. All the air blast, compressed air and oil pipes are carried overhead, with drops to each furnace.

The steam hammer furnace and the case hardening furnace have stacks for conducting the waste out of the building. From the other furnaces the products of combustion escape into the shop, which is not objectionable, as with the Kirkwood combination burner there is no smoke or unburned oil escaping from the furnace. The burner, which is shown in Figs. 2 and 3, maintains an efficient fire under all conditions, since the proper proportion of air and oil for complete atomization is automatically regulated in the furnace and is not left to the discretion of the operator.

It is necessary that the oil be thoroughly atomized—that is, broken into minute particles under the influence of the air or steam, and that the proper amount of additional air be supplied for combustion in order to secure proper burning. Experience has developed the fact that of the total air required in an oil furnace 10 per cent. is used for atomizing and the remaining 90 per cent. for combustion. In the Kirkwood combination high and low pressure burner the oil is fed to the burner at 15 to 25 lb. and there atomized by a small quantity of compressed air (or steam under certain conditions) at the same pressure; air blast at from 2 to 6 oz. is used for supplying the necessary oxygen for combustion. The amount of compressed air required for atomizing is so small that the supply required for a number of burners is almost negligible in a plant using compressed air for other purposes, and the purchase and operation of the small compressor necessary when compressed air is not already available is relatively inexpensive.

It is claimed that tests have shown that the burner will do the same work with 25 per cent. less oil than any type of low pressure or drip burner. It is also stated to be as noiseless as it is possible to make an oil burner and that the most complete regulation of the nature of the fire can be had by varying the amount of the air blast admitted. It is usual in other types of burner to provide separate adjustment of the air (or steam) and oil for atomization, which requires skill on the part of the furnace operator to get an efficient fire. In the Kirkwood burner, however, the supply of oil and compressed

air is regulated by one lever and the ratio between the two remains constant at what has been found to be the

Fig. 2.—The Kirkwood Combination Oil Burner Made by Tate, Jones & Co., Pittsburgh, Pa.

proper proportion for complete atomization. This adjustment is made and fixed before the burner leaves the

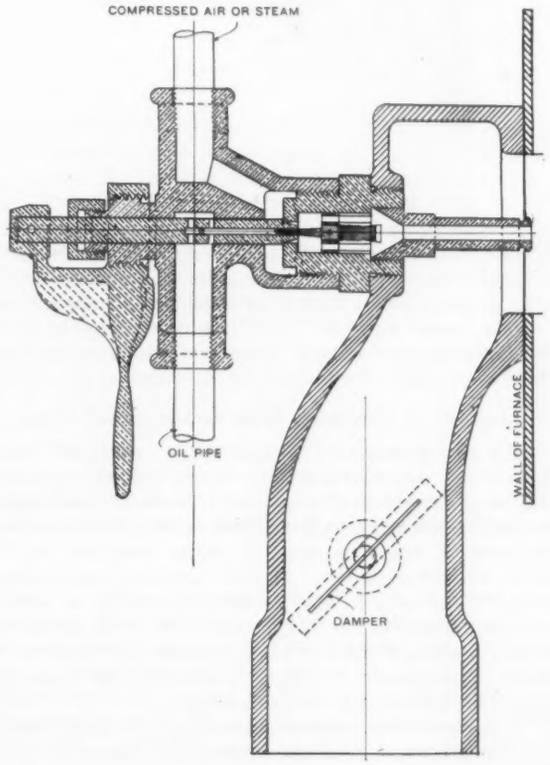


Fig. 3.—Section of the Kirkwood Combination High and Low Pressure Burner.

factory, so that even a careless or ignorant operator cannot have an inefficient fire.

Tate, Jones & Co. already have several installations of their furnaces and pumping system in successful operation. One is at the Trenton shops of the Pennsylvania Railroad Company and was installed in 1904, since which time eight additional orders for furnaces and equipment have been filled. At the McKees Rocks shops of the Pittsburgh & Lake Erie Railroad Company there is a large plate heating furnace installed, and at the Ramapo Iron Works there are oil-burning furnaces which are used for heating material for switch mechanism.

The National Enameling & Stamping Company's Report.

The results of the fiscal year ended June 30, 1907, have been made public by the National Enameling & Stamping Company. The income account is as follows:

	1907.	Increase.
Gross profits after charging cost of materials, wages, selling expenses, taxes and other operating expenses and bad debts	$2,464,214	$887,818
Deduct—		
Remuneration of officers, &c.	$87,000	*$4,927
Repairs and rentals	517,514	75,634
Interest	156,300	*15,316
Totals	$760,814	$55,391
Net profit	$1,703,400	$832,427
Interest on bonds	64,583	64,583
Balance for dividends	$1,638,817	$767,844
Dividends, preferred (7 per cent.)	598,262	.....
Surplus	$1,040,555	$169,582
Guaranteed reserve account	250,000	250,000
Final surplus	$790,555	*$80,418
Previous surplus	858,049	272,711
Profit and loss surplus	$1,648,604	$790,555
General reserve	1,250,000	250,000
Total reserve and surplus	$2,898,604	$1,040,555

* Decrease.

The company's balance sheet, as of June 30, showed total assets of $31,712,517, compared with $30,128,855 for the previous year. Of the total assets, $24,548,687 represented real estate, machinery and plant; $5,392,782, stocks, merchandise and material on hand; $129,746, stock in the National Mfg. Company; $1,203,260, accounts and bills receivable; $101,676, advertising paid for and $336,364, cash.

Vanadium Steel Tests.—In the presence of several automobile manufacturers from Cleveland, Detroit, and other points, the United States Steel Company, Canton, Ohio, on August 15 made another very successful heat of vanadium steel, amounting to about 30 tons. After proper heat treatment, test pieces from the last heat of vanadium steel made by the company showed the following results:

	Tensile strength. Pounds.	Elastic limit. Pounds.	Elongation. Per cent.	Reduction. Per cent.
A	228,375	228,375	..	..
B	200,000	185,000	11	56

Remarkable tests were also secured from this heat of steel in the way of resistance to crystallization. Vanadium steel is rapidly being adopted by the automobile manufacturers for the high grade work necessary to produce a modern car. This last heat was made for the Ford Motor Company, Detroit, Mich.

Creditors of the Reese-Hammond Fire Brick Company, Bolivar, Pa., have petitioned the United States District Court at Pittsburgh to have the company again put in charge of a receiver, claiming that illegal preference has been given Pittsburgh creditors. The Reese-Hammond Company went into receiver's hands some four years ago, but shortly afterward the receiver was discharged and the affairs of the company placed in charge of a committee of creditors.

The Kittanning Steel & Iron Mfg. Company, Kittanning, Pa., manufacturer of muck bar, has signed the Amalgamated Association scale.

The Elliptic Nickel Anode.

An Economical Anode for Nickel Plating.

BY A. FREDERICK COLLINS.

During the past few years the prices of copper and brass have increased so greatly that many small articles formerly made of these metals are now made of steel electrotyped with nickel. Among these may be named trunk and satchel fittings, novelties, small hardware, &c. On larger work, such as stove castings, machine parts and the like, nickel is also extensively used, both as a precaution against oxidation and on account of the lustrous polish that can be given the articles plated with it.

The First Cast Nickel Anodes.

Great advances have been made in nickel electroplating since its introduction in the early seventies, when, contemporaneously with Joseph Wharton, who was the first to bring to the notice of the American trade the value of nickel, the Hanson & Van Winkle Company, Newark, N. J., placed on the market the first cast nickel anodes. At the first these anodes sold for $4 per pound, but with the advance in methods of manufacture of anodes and in the production and refining of the ore the price has steadily declined until the present market rate is from 53 to 55 cents per pound.

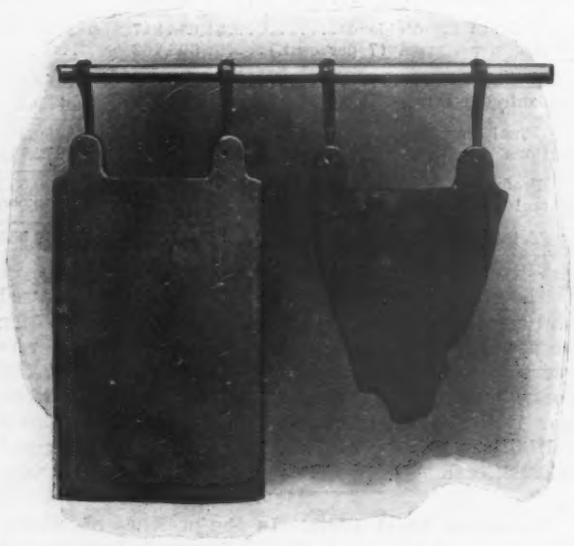


Fig. 1.—Flat Plate Anode for Nickel Plating.

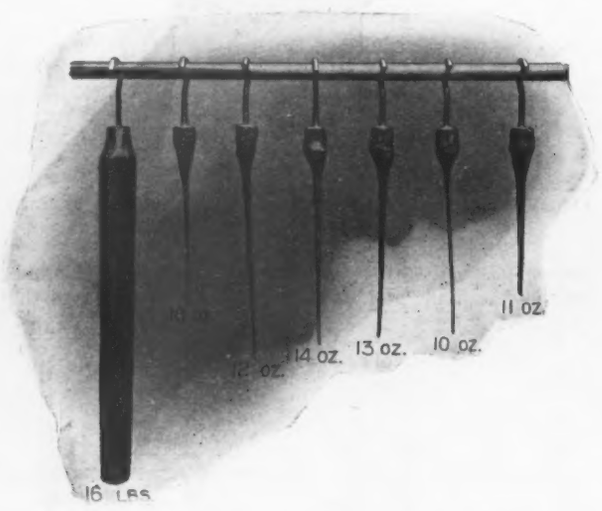


Fig. 2.—Elliptic Anode for Nickel Plating.

Since these pioneer days the company has introduced many innovations. One of these was the making of anodes of pure Canadian grain nickel, and casting them under conditions of manufacture that insure a plate of the proper structure and hardness—namely, a crystalline formation of the molecules of metal and a minimum of carbon. During the early days a nickel anode of from 70 to 75 per cent. purity was considered a satisfactory commercial product, and a considerable amount of scrap metal was utilized in the manufacture of the plate, but continued experiment on the part of the manufacturer, aided by the experience of the users, has resulted in an established standard of purity for nickel anodes—namely, a plate of 90 to 92 per cent purity. To produce a plate of this character, while a modicum of scrap metal may be utilized the quantity introduced into the furnace must be carefully watched, otherwise an unsatisfactory product will result.

Nickel is a very refractory metal, and its structure must not be too hard if it is to be used for plating. Its specific gravity varies from 8.36 to 9.26, according to the physical treatment to which the metal has been subjected, while it melts at a high temperature—about 2800 degrees F. Many anodes sold in the open market are made largely from scrap metal, and while such anodes may under analysis show a purity of from 90 to 95 per cent. yet owing to the heavy proportion of remelted metal used they contain a high percentage of carbon, and consequently do not have the wearing qualities of a plate made from the refined grain or ingot metal, which is practically free from carbon; hence the former will become soft and disintegrate rapidly under the action of an electric current.

The Elliptic Anode.

The most recent and valuable improvement to prolong the life of the anodes and save the metal is likewise due to the systematic investigations carried out by the Hanson & Van Winkle Company in its laboratories, and is the result of exhaustive experiments covering a period of several years. The improvement in question is the company's patent elliptic anode, a new type that possesses many meritorious points, and which overcomes the disadvantages inherent in other forms.

For many years it has been customary to use flat anodes, for the very good reason that there were no others to be had, and these flat plates may yet be found in many large plating establishments, which have not taken the time to investigate the saving that is effected by the use of the new elliptic anodes. These patent anodes are 2½ in. in width by 1½ in. in thickness, and are cast in ordinary lengths and in any metal.

In the original instructions for electroplating and electrotyping the exposed surface of the anode is recommended to be slightly in excess of the surface of the work to be plated. This is misleading and should read "active anode surface," which is quite another thing, and indicates that part of the anode which is especially under the influence of the electric current.

Anodes of Increased Dimensions Called For.

The development in electroplating operations led to the use of larger containers, which naturally required anodes of increased dimensions. To meet this requirements various schemes have been tried, as, for instance, crowding a larger number of plates into the tank or using irregular shapes. It has, however, been demonstrated that with a wide anode—*i. e.*, 6 in. or over—a corresponding cathode joining the work to be plated will receive a much thinner deposit opposite the center of the anode than opposite its edges, a fact that has been confirmed by micrometric measurement.

Experience has further shown that all metal anodes disintegrate more from the edges than from the center, which proves that in order to obtain the greatest reduction of the component particles of the metal a circulation of the solution around the anodes is essential. Herein lies one of the important advantages in using elliptic anodes, for the deposits from this shape are uniform, the disintegrating taking place from all sides of the anode equally, consequently the molecules are distributed uniformly throughout solution and not only hasten the de-

posit, but produce a heavier deposit in a given length of time.

Another feature in these anodes is the fact that they wear down evenly to a thin, narrow strip, and when worn down to such a point that it seems desirable to put in more nickel, the old ones, which take up very little of the available space in the tank, can remain until entirely consumed. The waste of the elliptic anodes averages but 5 per cent. of the original weight, while flat plate anodes show a loss of from 15 to 27 per cent.

Small Loss in Elliptic Anodes.

The small loss in the use of the new elliptic anodes as against those of the flat plate type is strikingly illustrated in Figs. 1 and 2. In the former the original weight of the flat plate anode was 13⅝ lb., while at the end of its usefulness it weighed 2 lb., the waste being 14.6 per cent. A glance at the illustration shows the character of the wear, and that the top part of the scrap plate with its two ears is almost as heavy as the same section of the original plate. In another form, Fig. 3, a flat plate anode weighed, when new, 17½ lb.; the weight of the scrap was 4⅞ lb., the resulting waste being 27.4 per cent.

In Fig. 2 the original weight of the elliptic anode was 16 lb., and it was used until only the head remained, so

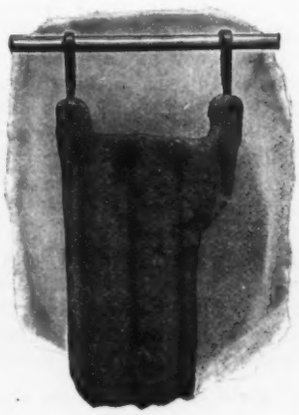


Fig. 3.—Flat Anode.

that the waste was but 5 per cent. The scrap from the elliptic nickel anode came from a large stove concern, and the flat scrap came from a stove manufacturer in a different section of the country, and there is clearly shown that in one case the consumer obtained a value of 95 per cent. on his original purchase, plus the return from scrap at 50 per cent. of the original cost, while the other obtained only 92.6 per cent. in one and 85.4 in another.

All forms of anodes except that of the elliptic of the Hanson & Van Winkle Company are used down to a certain point, when they have to be taken out and disposed of as scrap, and in this way an average of at least 15 per cent. of the original weight must be sold at a heavy loss, while, as previously stated, the elliptic anodes can be used until entirely consumed. The illustrations were made from photographs of the plates.

How to Flatten Celluloid Sheets.—In a model of a certain machine, to expose the action of a pin working in a slot of a lever, it was attempted to fasten a small piece of transparent celluloid across the space where the lever had been cut away. But the celluloid had been cut from a roll and would not flatten. Finally two pieces of cast iron with fairly smooth faces were immersed in boiling water until quite hot, and the celluloid was placed between two sheets of wet blotting paper and then between the two cast iron blocks and the whole clamped in a letter press over night. In the morning the celluloid was as flat as could be desired, and the task of gluing it to the lever, which had previously been impossible on account of the curl, was easily accomplished.

New Hulett Iron Ore Unloaders.

A New Ore Handling Plant at Cleveland.

The American Steel & Wire Company at its Central Works, Cleveland, Ohio, is constructing a new ore unloading plant, to be operated by electricity and designed to give rapid dispatch to boats. This plant will be operated in connection with the existing plant, which has a large number of unloading bridges and gravity bucket machines. The new plant, however, will consist of two Hulett automatic unloaders of 10 tons capacity, very similar in construction to those being installed at the new Gary plant. They will be equipped with weighing hoppers for weighing ore into railroad cars for shipment. It is estimated that these machines will handle at least 1,000,000 tons a year, and they will not only unload ore for the Central Furnace stock piles, but they are located conveniently for loading ore into cars to be sent to the American Steel & Wire Company's furnaces in Newburg 4 miles distant.

In connection with the unloading plant there will be a stocking and rehandling bridge. This latter will also be of the Hulett pattern, constructed by the Wellman-Seaver-Morgan Company, Cleveland, and will incorporate all the improvements which have been made in ore bridges within the last few years. The bridge will be 238 ft. span, 90 ft. cantilever extension. It will be supported on an inverted A frame over a shear leg on the tower. The span of the bridge will cover the stock yard, and the cantilever will reach out over the unloaders and railroad tracks for shipping. Ore that goes into stock will be dumped on a temporary pile at the rear, from which it will be rehandled into a large stock pile by the bridge. The bridge is built high enough so that it will pass over the unloading machines. The bucket will be carried on the bridge on a trolley, which has all the hoisting and cross travel equipment self-contained. It is expected that the bridge will take care of all the stocking and rehandling for the two unloaders, being designed for high speed operation.

More Ore Handling Machinery at Buffalo.

The Buffalo, Rochester & Pittsburgh Railway Company has contracted for an additional steam operated 10-ton Hulett unloader. The company is already operating one of these machines, and now expects to double its unloading capacity. Two of these machines will give this dock facilities for unloading the largest boats in comparatively short time. The plant will be in operation at the beginning of the season of 1908. The Wickwire Steel Company is also building a dock at its new blast furnace plant near Tonawanda. It will be equipped with a 10-ton electric Hulett unloader, which will be operated in connection with an ore storage bridge. This plant will be ready for operation early in the season of 1908.

The Board of Conciliation Award Accepted.—On August 15 the Republic Iron & Steel Company and the Western Bar Iron Association notified the Amalgamated Association of their acceptance of the award made by the Board of Conciliation, appointed to settle the dispute between the Amalgamated Association and these two interests over the puddling and finishing scale. The terms of this award were published in *The Iron Age* of August 15.

A large and representative body of gentlemen attended the midsummer outing of the New England Foundrymen's Association at the Squantum Club, near Providence, August 15. The Rhode Island outing, which has come to be an annual event with the association, has always been a most enjoyable one, for the Providence members, who arrange the details, see to it that nothing is overlooked that will add to the comfort and pleasure of the visitors. This year was no exception to the rule. A shore dinner was served, after which the members and their guests amused themselves in various ways at the several resorts near by.

Steel Rails of Better Quality.

The Latest Specifications Regarded as Not Meeting the Desideratum.

BY ROBERT JOB, PHILADELPHIA, PA.*

Broken and defective rails have caused wide discussion and inquiry within recent years, and the feeling is pronounced that stronger and safer material is necessary under present conditions of service. Close investigation has been made to determine the prime cause or causes of the widespread failures, and every effort has been made to get impartially at the truth in order that suitable corrective measures may be taken. It is thoroughly understood that axle loads have increased largely in recent years, and the question has been whether the sudden increase of rail failures has not been due simply to this cause; in other words, whether it is not a clear case of overloading with the usual consequences under such conditions. This query is rational, and leads naturally to a consideration of rail conditions.

How Changed Conditions Have Been Met.

About 25 years ago rails of about 70 lb. weight per yard were in common use, but owing to increasing weights and loads these rails did not have sufficient stability as girders, and it became difficult to maintain the track. The size of rail has been gradually increased therefore until to-day, under heavy traffic conditions, rails of 90 to 100 lb. per yard are the rule. This increased weight of the rails at once introduced new metallurgical problems. With the lighter sections it had been possible to continue the rolling of the steel until the temperature of the entire section had fallen to about the critical point of the steel or to about a low red color, and in consequence the granular structure of the steel of these light rails was exceedingly fine, producing great strength and ductility. With the heavier rails came changes in the relations of the constituent parts of the rail, and the flange was made thinner in proportion in order to give a wide bearing surface upon the ties. The effect at the mill has been to render it impossible to continue the rolling until all parts of the section reach a dull red color, since the thin flange cools to that temperature much sooner than the thicker head. The consequence has been that while the granular form of the flange is fine and its ductility good, that of the head, the real wearing surface of the rail, is coarse, with resulting relative brittleness and low ductility, irrespective of the composition of the steel, and in consequence the rate of wear and the tendency to mash down under heavy loads have been greatly increased. Here again heavy traffic conditions have had their influence, for owing to largely increased loads a high elastic limit in the steel has become an essential, and generally the best service results have been obtained, good practice in other respects being assumed, when the proportion of carbon has averaged about 0.60 per cent. This increased proportion of carbon in turn has lessened the ductility of the steel and has increased the harmful effects resulting from the hot finishing temperatures now prevalent, particularly so when the proportion of phosphorus also is high, as unfortunately is generally the case with Bessemer rails. It is a well-known fact that the light sectioned rails rolled 40 years ago gave excellent results in service, regardless of their composition, and for the reasons which have been mentioned it will be clear that with the heavy rails of the present form of section it is impossible commercially to obtain an equally fine grained, durable crystalline structure, even when the mill practice is correct in other respects. Furthermore it is well known to every railroad man that with each increase in size and weight of rails less and less satisfactory service results have been obtained.

New Sections as a Remedy.

Does not this, then, account fully for the present defects, and are they not, therefore, beyond the province of the mills to remedy, as long as the present form of section is maintained? A conclusive answer is given by the comparative service of the rails themselves when subjected in the same line of track to precisely the same service. In our practice we have known of instance after instance in which new heavy rails laid in track adjoining older, lighter ones have crushed after short life and have been removed, while the old rails still continued in the track, giving good service with few fractures or failures from the time that they were originally laid.

In illustration, we have in mind a case in which 90-lb. rails rolled in 1890 gave 14 years' service in a given length of track without turning, and with very few failures of any kind. A lot of 90-lb. rails were rolled in 1904 and laid adjoining the old ones, but numbers of the newer rails failed after comparatively short service, both by fractures and by mashing down in track. The composition of both lots was closely the same, excepting that the proportion of carbon tended higher in the older rails, averaging about 0.60 per cent., as against about 0.56 per cent. in the others.

It may be objected that as the older rails had been in track a longer time the defective rails among them had been weeded out and only the sound ones left in track. This phase has been investigated closely and we have found invariably that the defects in the newer rails have been out of all proportion to those present in the older rails throughout their entire life in track.

This greater efficiency of the lighter rails may, of course, be attributed in part to the greater proportional ductility of the steel due to its finer granular form, but that this is not the main cause of difference is shown by the fact that a large proportion of fractures and other failures occur at points at which the steel contains an excessive proportion of oxides and slag, or where the steel is otherwise sound. This has been noted particularly in various lots when individual rails mashed down in track after short service, while others adjoining in the same track, rolled in the same lot and having practically identically the same composition, were unaffected by the traffic and gave satisfactory service.

Heavy Rails Liable to Crush Down.

A more rapid rate of wear would naturally be expected of the heavier rails owing to the coarser granular structure, but it is a matter of general observation that this more rapid grinding away of the steel is not by any means the most serious present difficulty, particularly from the standpoint of safety, for it is the rapid crushing down after short service and the sudden fracture which are particularly disastrous and entail the greatest menace. Exhaustive investigations have been made to determine the causes of these latter effects, and the proof has been indisputable that the fault is due to porous or unsound condition of the steel.

It is perfectly true that flat wheels and poorly balanced drivers have a decided influence upon the life of the rails, and we have known of instances in which numbers of rails have been fractured by a single piped tire. Cases of this kind generally can be identified by the marking upon the rail and by the characteristics of the fracture. Severe gagging of the rails at the mills, also, often causes fractures, since when so treated the metal is strained far beyond its elastic limit and failure is almost certain to develop.

Much discussion has been heard regarding overloading of rails, and the statement is made that by simply increasing the weight of rails, say to 110 lb. per yard, the necessary strength would be obtained and failures would disappear. Unfortunately, however, such a result would be directly contrary to the experience of the past, for, as has been mentioned, it is common knowledge that each increased weight of rails has assured increased defects and rate of wear under any given traffic, and it is clear that further increase in weight would simply add to the cost of the rails without giving any betterment in quality, for the reason that the inherent causes of defects now present would still remain untouched and would, in fact, be accentuated by the increased size of the rail.

* Of Booth, Garrett & Blair. Formerly chemist of the Philadelphia & Reading Railroad. Mr. Job's contribution is in part an answer to points brought out in the discussion on steel rails at the meeting of the American Society for Testing Materials, Atlantic City, June 21, 1907.

How to Secure Better Rails.

What then is needed to insure greater freedom from the defective conditions now prevalent?

Primarily, greater care in the manufacture of the steel is essential in order to guard against unsoundness. Ingots must be given sufficient time to become solid, instead of being forced through the rolls while the interior is in a fluid condition. Cropping must be sufficient to get to clean, solid metal, practically free from unsoundness and excessive segregation, and in order to detect unsoundness of very serious character or serious segregation when present the drop test should be made upon a rail butt from each heat of steel, the butt being taken invariably from the top of an ingot in order that the poorest quality offered may be tested. Rails rejected under this test should not be accepted for any service, since when this is done they are liable eventually to get into track in places where only high grade material should be permitted.

The rail section also should be given attention, and the proportions should be so rearranged that rolling can be kept up steadily until the temperature of the rail at all parts is nearly at the critical point of the steel. The latter practice would bring about a return to the fine crystalline form of the earlier rails, and would produce a tremendous increase in the toughness and serviceability of the rails, and this entirely apart from any change in composition. It is a fact, however, that with the increased fineness of structure a higher proportion of carbon than can now be safely used would be possible and desirable.

The necessity for excessive gagging at the mill may be avoided by rejecting each rail in which the camber exceeds a certain reasonable minimum, such limit, for instance, as has been proposed by the Society of Civil Engineers.

Open Hearth Rails.

Another aid toward securing more serviceable rails lies in the abandoning of the Bessemer process and the substitution of basic open hearth steel. By means of this latter process the proportion of phosphorus can be reduced from 0.10 per cent. to below 0.03 per cent., and the sulphur can also be greatly lowered. The effect of these changes would be to increase the toughness of the steel so greatly that a considerable increase in the proportion of the carbon may safely be made, thereby adding to the hardness of the steel and increasing the capacity for wear. In recent years the production of open hearth rails has increased largely, as the possible merit has been realized, and we are satisfied that the use of the Bessemer process for rails of heavy sections will before long become a matter of history, especially so since the cost of manufacture by either process is practically the same, and the rolling of open hearth rails by all of the mills instead of by a few as at present is simply a matter of installation of the necessary equipment. It should be remembered, however that open hearth steel is subject to the defects of improper manufacture, which have been mentioned and which have resulted in recent failures, and consequently the mere change from Bessemer steel to open hearth steel will not give the full relief desired.

The Testing Society Specifications.

In the effort to obtain efficient material various specifications have been carefully worked out, and some of these are found to give very fair results when a sufficient force of inspectors is placed at the mill to see that each provision is rigidly enforced. The latest specifications proposed are those of the American Society for Testing Materials. These, however, pretend to be nothing more than a compromise between engineers and manufacturers, and are of absolutely no interest to the consumer in the bettering of quality, since they merely outline the very grade of material which in the past decade has caused universal complaint. No stipulations are made which give any promise of correcting existing defects. Open hearth steel is not even mentioned, in the obvious intent to stave off as far as possible any changes in the present plants, and the drop test is so devised that no benefit can result, since the test butt can, if desired by the manufacturer, be taken from the center of the ingot, where the steel is most free from unsoundness, and in addition only one heat in five is tested. Such a specification is useless from a practical standpoint.

The need of better quality of material in rails is strongly felt by every railroad in the country, and the indications are that marked increase in efficiency will result from concerted action by study of the underlying principles, and by working out in practical form details which will insure the necessary properties in the finished product.

Electricity in German Mines.

Reduction of mining costs by electric operation has been effected in the Gewerkschaft Carlsfund mines in Germany, where a storage battery system has been installed in connection with the generator outfit. The plant, as explained by the *Engineering Magazine*, was equipped at first with one 100-kw. polyphase generator, and two smaller ones, rated at 50 and 35 kw. Although the average load was only about 30 kw., there was such an extreme variation in the load from one minute to the next that it was found necessary to run the large machine almost continuously. A storage battery of about 650 amp.-hr. capacity was installed, and connected to the terminals of a direct-current machine, from which it was charged during light loads. This machine was driven by the 30-kw. polyphase generator, running as a motor. On the same shaft was mounted a single phase rotary converter, power for which was supplied by a series transformer in one of the three-phase mains.

Direct current from this rotary is passed through a second winding on the field of the direct current generator, the connections being such that the latter opposes the normal shunt excitation. During periods of light load, the voltage of the direct-current machine is high, and it therefore charges the batteries. As the load increases, however, the voltage of the generator decreases, until it finally begins to operate as a motor, driving its motor as a generator, and thus supplying power to the system. By this means the load curve is smoothed out very markedly, and it has been found possible to carry it by means of the 50-kw. generator, except during periods of the heaviest load.

British and American Street Car Facilities.—The secretary of the National Civic Federation commission on municipal ownership of public utilities says that the report of the engineering and other experts will exceed one million words. Mr. Clark, of the commission, compares in his report the street car facilities of British and American cities. In 1902, in Great Britain, the town and city population to each mile of street car track was 12,476, while in the United States there was a mile of track to each 1,516 of town and city population. In Great Britain there was one car for each 3760 of population, which in the United States there was one car to 574 city residents. Thus, the urban resident of the United States had more than six and a half times the number of cars available for his use than were available for the British inhabitant. The British systems carried 1,394,452,983 passengers, while the American lines carried 5,521,509,521, and of these 1,062,403,392, or practically 90 per cent. of the British total, were transported in the United States free on transfers. The figures were considered by the writer a strong argument in favor of private ownership.

One of the largest blasts ever fired in France was discharged last fall at the quartzite quarries at Cherbourg, and is said to have displaced 120,000 tons of stone. A tunnel measuring 6 ft. wide and 6 ft. high was driven into the face of the cliff for a distance of 70 ft., and at its end two branch tunnels, each 20 ft. long, were driven to the right and left, respectively. These branches ended in chambers 40 ft. apart and 70 ft. from the face of the cliff, and measuring each 10 x 6 x 6 ft. The chambers were charged with 8½ tons of blasting powder and 280 lb. of dynamite, and the blast was fired electrically. The quartzite obtained from this quarry finds much favor in England as a road material.

A New Cincinnati Open-Side Shaper.

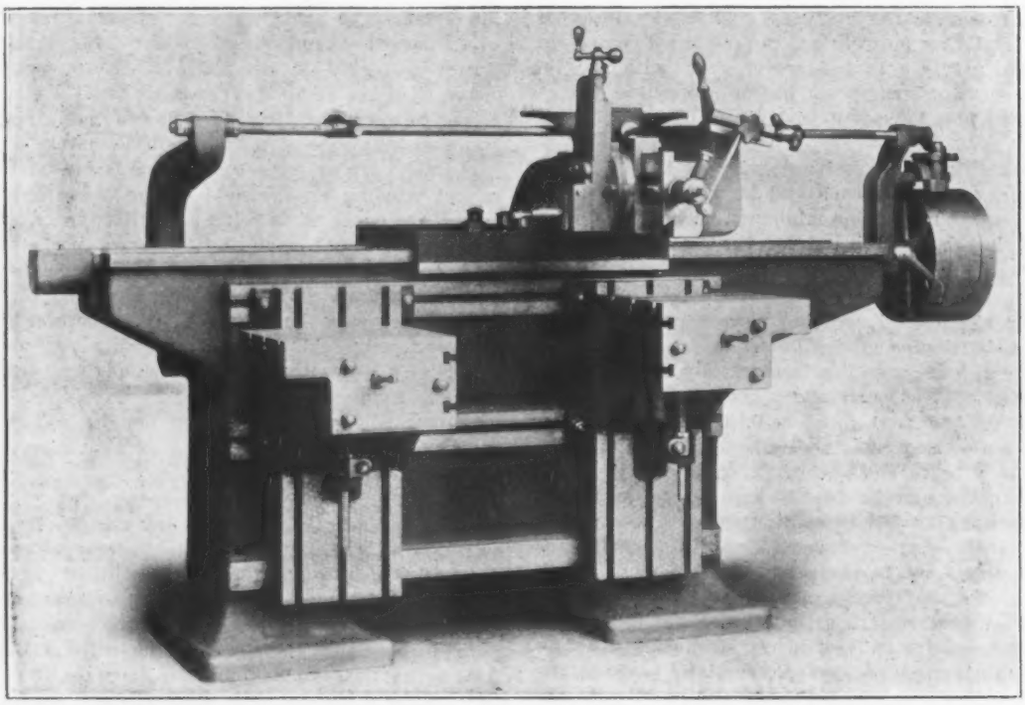
A description was given in *The Iron Age* January 3, 1907, of a 15 x 30 in. open-side shaper which was the first of a new line taken up by the Cincinnati Shaper Company, Cincinnati, Ohio, in extension of its range of product. Up to this time the latter included pillar and traverse shapers, neither of which is adapted to certain classes of work that an open-side shaper is peculiarly fitted to handle, with greater advantage even than a planer. A second size is now being built by the same company, and this a 15 x 60 in. size, is herewith illustrated. In many respects it is similar to the 15 x 30 in. size previously described; the principal difference other than size is that this latest one has two tables as the engraving shows. Both shapers are of the Richards type, to which the company has added improvements, the more important being the belt-shifting and table-reversing mechanism that was quite duly described in the earlier article.

The head is driven by a single screw and bronze nut, and without the intervention of gears, the driving pulley being mounted directly on the screw. The latter is 2⅛ in. in diameter and is of 0.5 carbon steel. The saddle has a long and wide bearing on the bed and a narrow and deep guiding surface the function of which is to prevent the binding that is particularly apt to occur when the tool is at the outer end of the rail. Lateral play is taken up by a taper gib adjustable lengthwise by screws at each end so that uniform contact is secured on both sides of the gib. Taper gibs are also provided in the mounting of the head on its saddle, and the latter on the cross rail.

The cross feed of the tool head is by power or hand and is positive and adjustable. The down feed is by hand. The novel design of reversing mechanism, to repeat in part the description given before, makes use of a rocking shifting rod both for reversing the motion of the saddle and for operating the automatic cross feed to the head. The rod is automatically turned by cams on the saddle coming in contact with adjustable dogs on the rod, or by hand from the saddle if desired. This rod has ball bearings as have also the elevating screws for the tables.

The head has a down feed of 6½ in. and swivels to any angle in a plane parallel with the cross rail. The setting at an angle is facilitated by graduations on the circular plate and the down feed screw has a micrometer collar reading to 0.001 in. The tables are raised and lowered by crank handles, or may be removed entirely and the work bolted upon the aprons, or both tables and aprons may be removed and the work bolted against the face of the column. All flat bearings are hand scraped to surface plates and all tee slots are cut from the solid. Ample provisions are made for oiling.

The machine will plane over any part of an area 60 in. long by 15 in. wide. The greatest distance from the head to the table is 23¼ in. The table is 15¾ in. wide and 15 in. deep and has a vertical adjustment of 19 in.



The 15 x 60 In. Open-Side Shaper Built by the Cincinnati Shaper Company.

United Sheet & Tin Plate Property to Be Sold.

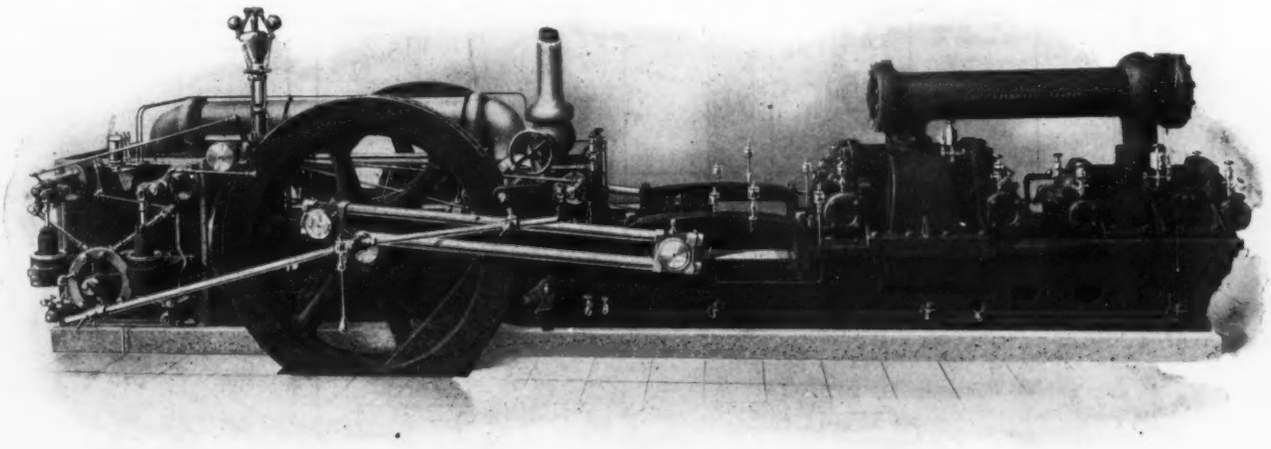
Daniel B. Torpy, Marietta, Ohio, receiver of the United Sheet & Tin Plate Company, will offer the Marietta and Tuscora plants at public auction in the Court House at Marietta, August 22. Both plants have commodious buildings. The Marietta Works, at Marietta, which were built in 1902-3, comprise black plate mills and a tin plate plant. The black plate mills contain four sheet, four pair, and four annealing furnaces, one stand of 28-in. and three stands of 32-in. hot black plate mills, and four stands of 36-in. cold mills, electric cranes, dynamos, engines, boilers and other fixtures and appliances to complete and equip the plant, which is in first-class condition and ready for operation, designed to make black plates for tinning, polished steel, and various specialties, with an annual capacity of 12,000 tons of black plate. The tin plate plant is fully equipped, having nine sets, three for tin plates and six for terne plates, with a weekly capacity of 900 boxes of tin plate and 1800 boxes of terne plates. The Tuscora Works, at Newcomerstown, Ohio, were built in 1901-2 and contain four sheet furnaces, four pair furnaces, four annealing furnaces, and seven sheet mills, as follows: Two 38, one 40, and one 52-in. hot and two 40 and one 50-in. cold. There is also a tract of 82 acres of coal lands near Byesville, Ohio, which will be offered for sale. The receiver states that these properties must be sold for cash, and at not less than two-thirds the appraised value, the Marietta plant being appraised at $49,000 and the Newcomerstown plant at $21,000.

The Rocks Coal & Coke Company has bought 160 acres of coal land at Lynn Station, Pa., from the Monongahela Consolidated Coal & Coke Company for about $300,000, or over $1,800 per acre. The land purchased adjoins a present tract of 75 acres owned by the Rocks Coal & Coke Company, which will build about 210 coke ovens on the property.

A Sullivan High Economy Air Compressor.

The rapidly extending use of compressed air in mechanical operations emphasizes the importance of economy in supplying this form of power. A highly efficient air compressor was what the Sullivan Machinery Company, Chicago, sought in designing the machine herewith illustrated, which is a Corliss straight-line compressor, with tandem-compound steam cylinders and two-stage air cylinders. It is especially adapted for high duty service in mines and plants requiring equipment combining high steam economy with moderate price.

This machine is designated as class WC, and is substantially a tandem compound steam engine, with full Corliss valve gear, attached to the flywheel end of a standard Sullivan two-stage straight-line compressor. The high-pressure steam cylinder is of special design, to make room for the Corliss valve bonnets and dash pots between the cylinders and flywheels, to admit which the steam chest is offset to one side. The dash pots for closing the steam valves are set directly on the main frame and the rods for operating the exhaust valves are arranged in the usual way, except that they are longer. Back bonnets are provided as usual and the frame is so designed that either one or all of the steam or exhaust valves may be removed without disturbing the valve setting.



The Corliss Straight-Line Compressor with Tandem Compound Steam and Two-Stage Air Cylinders as Built by the Sullivan Machinery Company, Chicago.

The low-pressure steam cylinder is attached to the end of the frame by rigid distance pieces. The bottom feet of this cylinder are on the same level with the bottom of the main frame and its weight is supported by an extension of the foundation. Practically the same pattern is used for making this cylinder that is used for the Sullivan cross-compound Corliss machines. It embraces all of the regular valve gear usually furnished with the latter type of machine.

There are no adjustments between the flywheels and the steam cylinders which require attention while the compressor is in operation. The piston rod stuffing boxes are packed with fibrous metallic packing, which needs only occasional care. The main bearings and other parts which cannot be oiled by hand while running are lubricated by a system of pipes, leading from a cluster of oilers mounted at a convenient point, so that the engineer can tell at a glance when one of them is empty. The eccentrics for operating the valve gear on both the high and low pressure steam cylinders are located on the crank pin on the outside of the flywheels, so that they are easily accessible. The eccentrics, rocker arms, valve stems and all connections located between the flywheels or between the main bearings on the WB-2 type are dispensed with in the class WC. The governor pulley is all that is located on the shaft in their place. The removal of these parts allows the use of two piston rods between the high and low pressure steam cylinders, which are necessary in order to straddle the crank shaft, which is kept in its original position in line with the cylinders.

The governor is located on a separate mounting and is a combined speed and pressure regulator. In appearance, it is of the Corliss fly-ball type, but it operates in unison with the pressure attachment. Either may also operate independently of the other when necessary. The steam from the high-pressure cylinder is carried around the outside of the cylinder barrel to the top by a passage cast with the cylinder, and discharges into a covered receiver pipe, extending from the top of the high-pressure to the top of the low-pressure cylinder.

The inlet valves on both the low and high pressure air cylinders are of the semirotary pattern, positively driven by rods from an eccentric pin on the engine flywheel. The action of these valves permits the cylinder to fill itself completely at each stroke, with air at the temperature of the atmosphere, and there is claimed to be no wire-drawing or leakage. The discharge valves are of the automatic poppet type, so arranged as to reduce clearance losses to a minimum. They are removable, together with the valve seats, so that the maintenance of a perfect fit is a simple matter.

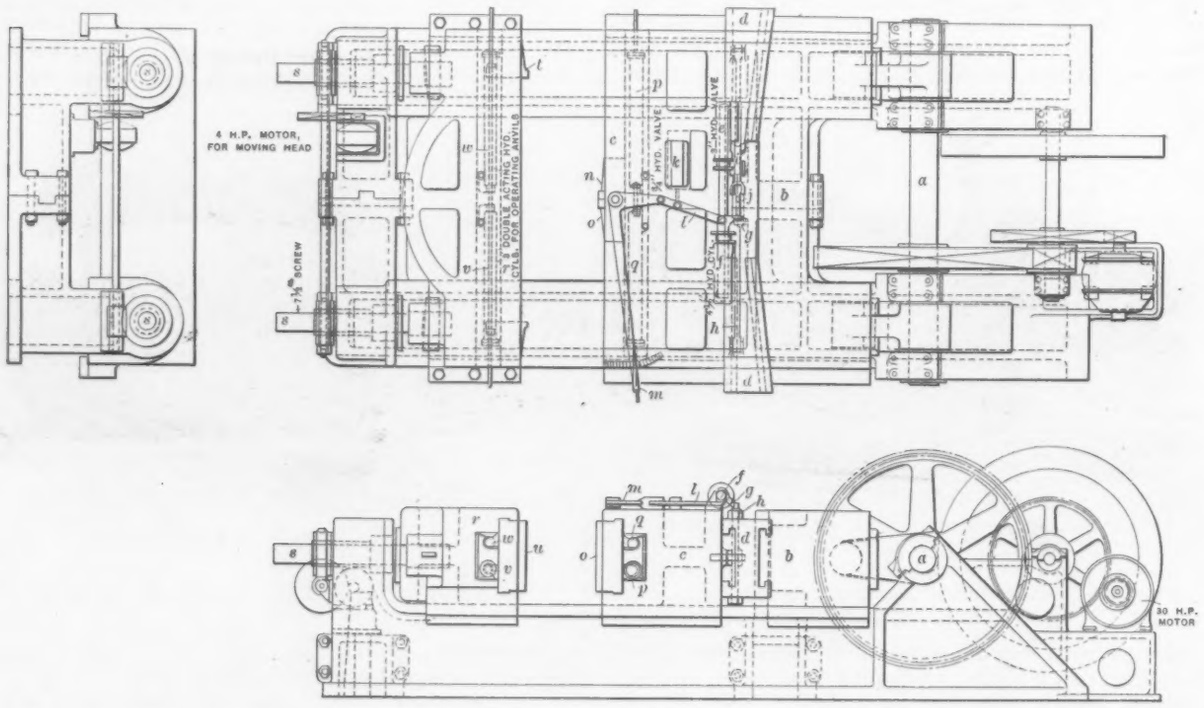
Ideal isothermal compression is approximated in these machines by a remarkably effective cooling apparatus. This consists of heavy water-jackets on the air cylinders, and an intercooler of ample proportions containing copper water tubes, across which the air must pass several times in its course from the intake to the discharge cylinder.

The compressor is very substantially built, being self-contained on its heavy frame and on the distance pieces connecting the two steam cylinders. These parts are sufficiently massive to sustain the low-pressure steam cylinder of themselves, without the aid of foundations, if such a necessity should arise. Among the advantages of the straight-line type of air compressor are low weight and simple and compact foundations, which help to reduce costs of building, transportation and erection. These compressors are at present built in capacities ranging from 909 to 2450 cu. ft. of free air per minute.

Lubricants and Bearings.—With a babbitted bearing, any kind of grease or oil may be used, it has been stated, but when the former has been softened down with lead or with any alloy having zinc and lead in its composition, care should be exercised in the selection of the oil used to lubricate it, as such selection forms a considerable factor in the life of the bearing. It is often a question in designing the commoner class of machinery, such as agricultural implements or coal elevating outfits, whether to put in high priced bearings, with which any kind of cheap lubricant may be used; or to employ bearings of less cost which, to be equally as efficient and to wear as long, would necessitate the use of a lubricant costing two or three times as much as in the former case. In such a case as this, it is largely a question of balancing the greater cost of the better lubricant against the interest and depreciation on the more expensive bearing, and choosing from the basis of such a commercial comparison.

The Gardner-Biggert Straightening Press.

Many features of interest are to be found in the horizontal straightening and bending machine invented by K. C. Gardner and F. C. Biggert, Jr., engineers for the builder, the United Engineering & Foundry Company, Pittsburgh, Pa. The machine is of the class in which bending is accomplished by the horizontal movement of a ram against the work while it is backed by a stationary head, and shows most ingenuity in the means provided for accurately and quickly adjusting the bending dies or anvils. The normally stationary head is adjustable for large differences in the depth of work to be acted upon and the ram itself has an adjustment of 1½ in. by means of wedges for finer settings. A 4 hp. motor, acting through gears and screws, moves the adjustable head, and hydraulic cylinders actuate the wedges and anvils. The bending stroke is only 1 in., and since a 30-hp. motor is used solely for this drive and effects only 25 strokes in a minute, it will be appreciated that a very powerful bending force may be exerted. The size also gives some idea of the strength and capabilities of the machine. It is 27 ft. 5 in. long over all, and 11 ft. 9 in. wide. The maximum opening between the head and ram is 2 ft. 3 in. and the minimum 3 in. The ram reciprocating shaft is 11 in. in diameter, and the large gear which it carries has a pitch diameter of 84 in., and a face width of 9 in. The pinion meshing with it has a pitch diameter of nearly 17 in., and is mounted on a 5-in. intermediate shaft which carries a flywheel 7 ft. 4 in. in diameter by 9 in. face. The screws which adjust the movable head are 2 in. in diameter.



The Gardner-Biggert Straightening and Bending Machine Built by the United Engineering & Foundry Company, Pittsburgh, Pa.

The operation of the machine will be best understood by reference to the lettered parts in the accompanying engraving, which gives a plan and side and end elevations. The main operating shaft *a*, is driven as before explained, and carries eccentrics which actuate connecting rods or pitmans connected to the slide block *b*. This block moves horizontally in guides on the bed of the machine and is connected with the reciprocating bending head *c* through the interposed adjustable wedges *d*, which are dovetailed to the slide block *b* and the head *c*. These wedges afford limited and exact adjustment of the head, and are actuated by the two hydraulic cylinders *e* and *f*, the pistons of which are connected by a common rod. The latter has a lug, *g*, projecting downward from it, which is connected by a link, *h*, with one of the wedges, *d*, and by a link, *i*, and reversing lever, *j*, with the other wedge. The cylinders are operated by water pressure controlled by the valve *k*, which consists of a piston having two heads commanding ports connected with the outer ends of the cylinders *e* and *f* respectively. The piston rod is extended through the head of the valve casing and is connected to a link *l*, which is in turn connected to one arm of a controlling lever, *m*. The movement of the latter serves to reverse the valve to open the supply to one of the cylinders and allow the other cylinder to exhaust; the cylinders are single acting and exhaust through their supply pipes into and through the valve casing.

The head *c* is provided with the two laterally movable bending dies or anvils *n* and *o*, which are arranged to slide toward or away from each other in guides in the head. For moving these anvils there are two double acting hydraulic cylinders *p* and *q*, the supply pipes to which are controlled by ordinary valves. The piston rods of these two cylinders are connected directly to the movable dies or anvils, and the cylinders are seated in the chamber of the head *c*.

The normally fixed head, *r*, is mounted in guides on the bed so that it may be adjusted toward or away from the head *c* by the two screws *s* which work in nuts in upwardly extended parts of the bed. The screws are feathered to worm gears which are engaged by worms on a transverse shaft spur gear connected to the small motor before referred to. The head *r* has the two movable dies or anvils, *t* and *u*, which are mounted in guides to move toward or away from each other under the influence of the two double acting hydraulic cylinders *v* and *w*, whose plungers are connected to the dies in much the same manner as the cylinders *p* and *q* are connected to the dies *n* and *o* in the head *c*; and the supply lines to the cylinders are similarly controlled by ordinary valves. Flexible connections are made in the water lines where necessary to permit unrestricted movement of the parts that carry the cylinders.

From the foregoing it will be seen that the bending dies or anvils can be quickly adjusted to the desired relative positions by manipulating the proper valves controlling the supply to and exhaust from the respective actuating cylinders. In an even more simple manner the adjusting wedges are operated by moving the lever *m* to

open the controlling valve, and when a certain amount of adjustment has been made by the wedges, the movement of their actuating pistons will, through the link *l*, automatically return the valve *k* to its former position. This relieves the operator from the necessity of manually closing the valve. As before stated, the screw adjustment of the head *r* is employed when a considerable change in distance between the two heads is required, and the wedge adjustment when finer and more accurate setting is necessary.

Osmer Pneumatic Vises.

The extensive use of compressed air in shops and factories has made the economical application of pneumatic power possible to tools that would otherwise continue to be more conveniently and cheaply operated by hand. An exemplification of this is seen in the engravings herewith presented, which represent two forms of pneumatic bench vise invented and manufactured by J. E. Osmer, master mechanic of the Northwestern Elevated Railway Company, Chicago. In construction these tools are exceedingly simple, and are also speedy, practical and easy of operation.

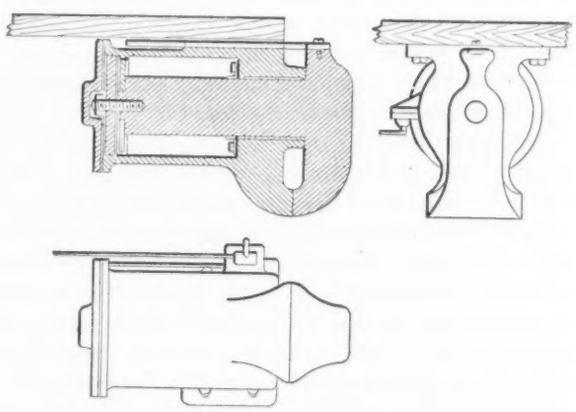
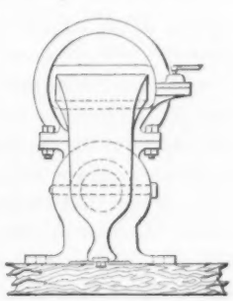


Fig. 1.—The Osmer Fluid-Actuated Vise for Railroad Shops.



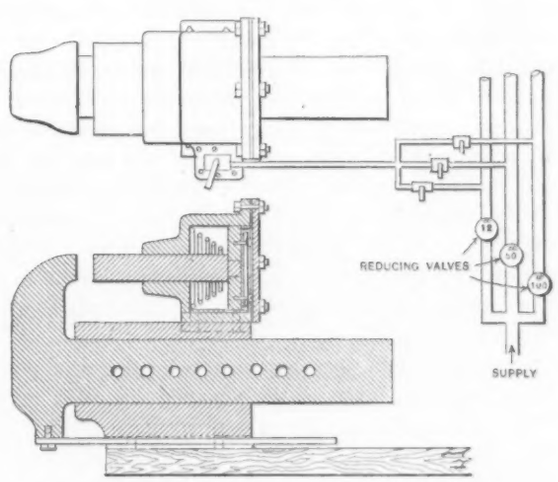


Fig. 2.—A Manufacturer's Fluid-Actuated Vise, Another Form, Patented by J. E. Osmer, Chicago.

Fig. 1 represents a form of vise especially adapted to railroad machine shop and roundhouse work. Both the jaws and the body of the tool are made of strong cast iron, the jaws being especially hardened. The air cylinder is contained in the body of the vise, with its rear head flange bolted in the usual manner. The front jaw is cast with a stem, which is introduced through a central bore into the cylinder and constitutes the piston rod, to which the head and follower plate is attached by a stud bolt and nut, as seen in the illustration. The piston is packed by a packing ring bolted to the inner face of the forward end of the cylinder. To open the jaws air is admitted from the valve chest containing the controlling valve at the side and near the front of the vise, through a pipe connection leading to an inlet in the rear cylinder head; air for the reverse or closing movement is let into the cylinder directly from the valve chest into which the air supply pipe leads.

The valve arrangement is simple, but affords effective control of the opening and closing movements. Supply and admission ports in the valve seat are connected for forward and reverse motion by two grooves in the face of the rectangular slide valve suitably located for this purpose. The valve is actuated by a right angle projection of the valve stem, which engages parallel sides of a groove in the inner side of the valve. The parts are so arranged that by a turn of the valve lever air used for closing the jaw is admitted to the pipe leading to the inlet at the rear of the piston and serves to drive it forward, thus opening the jaws. It will be observed that this action is made possible by the differential of piston areas created by the displacement of the rod. By placing the valve on lap position the movement can be stopped and held at any point of the stroke. A guide rod attached to an extension of the outer head and sliding through an opening in the base of the vise serves to steady its motion.

The vise shown in Fig. 2 is designed for use in manufacturing plants where the work generally consists in a more varied assortment of shapes. In this type the cylinder is cast in a separate piece and is mounted on the rear end of the vise body, to which it is securely bolted. The outer jaw has a round sliding stem passing through a bore in the body of the vise, as in Fig. 1, but in this case it is the fixed member, the inner jaw being movable. It is adjustable, however, being provided with extension stops, and is held in its graded positions by a pin extending through a hole in the side of the vise and engaging similar holes in the stem, indicated in Fig. 2. The jaws of this vise are closed by air admitted to the rear of the inner jaw piston, through a controlling valve similar in pattern to the one described before, but instead of opening by air pressure a coil spring bearing against the front surface of the piston head forces the jaw backward, when the air is released from behind it. By the attachment of suitable dies to the jaws of this vise it may be used as a punch, stamp, shear or metal former. The type in Fig. 1 is made in three sizes, with 6, 7 and 8 in. jaws and cylinders, respectively, and 10, 11 and 12 in. jaw openings; with 100 lb. air pressure it has rated gripping pressures of 1865, 2590 and 3436 lb., in order. The vise shown in Fig. 2 is furnished in five sizes from No. 6 to No. 10, with a total pressure capacity of 2829 lb. for the smallest and 7854 lb. for the largest.

A number of these vises may be supplied with air through a system of piping, which by the use of reducing valves allows the pressure to be varied to suit requirements. Thus with a three-pipe combination, if, where the maximum available pressure is 100 lb., only 70 lb. is required for the work in hand, the supply from the high and low pressure lines may be shut off by stop cocks conveniently placed, and air may be admitted through a reducing valve in the middle line set at that pressure. A series of vises connected with such a system can be used simultaneously at any one of the three pressures without interference.

A pamphlet has just been issued giving a revised list of the membership of the American Foundrymen's Association, including the additions made at the Philadelphia convention in May. The total membership is now 612, the largest in the history of the association.

The Colonial Steel Company, Monaca, Pa., has signed the Sons of Vulcan boiling scale.

THE IRON AGE

1855-1907.

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The Steel Corporation's New Construction Policy.

The broad policy of the United States Steel Corporation in providing for new steel making capacity has been a subject of comment, both for the great scale on which appropriations of that character are made and for the foresight that has set aside millions months in advance of their actual expenditure. Investors in railroad securities, accustomed to bond issues for improvements, are often unable to appreciate the rigorous financing that now obtains in the steel industry. That new construction or the acquisition of additional mineral or manufacturing property should be paid for out of surplus, and often very largely provided for before a spade is struck in the new ground, has been regarded in some quarters as ultra-conservative, while an occasional protest has come out because dividends were not enlarged. Recently prominence has been given to the amounts set aside by the Steel Corporation for its vast programme of construction at Gary, Ind., since this enterprise embodies in a conspicuous way the new policy of getting ready for an expansion in steel consumption before it comes.

What has actually been done in providing for the Gary plant is remarkable enough, without the exaggeration of recent statements, as, for instance, that $45,000,000 had been appropriated beyond the original estimate of $75,000,000. In 1905 $10,000,000 was set aside from surplus for the new project, and in 1906 $21,500,000. Out of the $14,500,000 appropriated from surplus in the first quarter of 1907 for "additional property, construction and discharge of capital obligations," $5,500,000, it was stated at the time, was for Gary. That gave a total of $37,000,000. No official statement was made of the amount intended for Gary out of the $18,500,000 for "additional property, construction," &c., appropriated from surplus for the quarter ending June 30. Assuming a similar proportion to that set aside in the five previous quarters, we should have about $7,000,000. Thus it may be safely said that not far from $44,000,000 has been devoted thus far to the Gary enterprise. This amount is nearly sufficient to cover the original cost of land and to pay for all the work thus far definitely planned—namely, for harbor and docks, eight blast furnaces, 56 open hearth furnaces and accessory finishing plant, together with the building of the city of Gary, so far as that has been laid out. The basis for so saying is the statement in the last annual report of the corporation that the expenditures to December 31, 1906, on Gary construction were $4,720,158, including payments for real estate, and that "the estimated amount yet to be expended on account of the foregoing approved work, and including payments to be made in 1907 for balance cost of real estate, is $40,000,000." It thus appears that provision has already been made out of surplus for Gary work that will still be in progress 18 months or two years hence.

It is evident from the above that the Steel Corporation financiers are not making a mistake like that often charged to the railroads of waiting until the inadequacy of their facilities becomes notorious before taking steps to provide new track, terminals and equipment. The contrast in the two methods of financing is emphasized by the ability of the Steel Corporation to carry forward plans involving millions of outlay at a time when a scarcity of money is limiting industry and commerce in all the leading countries of the world.

The facts as to the Gary financing become more impressive when it is added that in the 18 months ending with June, in addition to nearly $34,000,000 set aside for Gary, the Steel Corporation took approximately $50,000,000 from surplus earnings for other new construction. It will be interesting to set down the figures for these 18 months and note how the dividend disbursements, the appropriations for additional property and new construction and the balance carried to surplus compare:

Preferred dividends, 10½ per cent	$37,829,515.50
Common dividends, 3 per cent	15,249,075.00
Total dividends	$53,078,590.50
Appropriated from surplus earnings for additional properties and construction and for contemplated appropriations	$83,000,000.00
Carried to surplus	19,924,515.94

Thus approximately $2 have gone for new construction and increase of surplus for every dollar distributed as dividends. In the case of a great trunk line, noted for its strong constructive policy, the rule of years has been a dollar for dividends and a dollar for improvements. It scarcely need be said, however, that the Steel Corporation has not maintained at all times any such ratio between dividends and new construction appropriations as the above table shows. Below we give similar items for the entire period of its existence up to June 30, 1907:

Preferred dividends, 44 per cent	$181,145,759.16
Common dividends, 12½ per cent	63,515,957.50
Total dividends	$244,661,716.66
Appropriated from surplus earnings for additional properties, new construction, &c.	$135,027,364.00
Carried to surplus	79,902,370.00

That is to say, in the whole period from its organization down to the middle of the present year, instead of $1 in dividends to $2 for new construction and surplus, as in the last six quarters, the Steel Corporation has paid out $1 in dividends to 88 cents for new construction and surplus. The contrast between a ratio of 100 to 200 and a ratio of 100 to 88 reflects the remarkable earnings of the past year and a half, due to prosperity, to the increased capacity of the corporation's plants (amounting to 44 per cent. in finished material up to the end of 1906) and to cumulative economies in operation. It represents also a policy of rigorously applying the surplus of prosperity to providing new capacity, compensating for the small appropriations possible in times of recession. Naturally the present policy looks toward a time when the building up of a large surplus shall be succeeded by a régime of surplus maintenance under which, under all conditions, an approximate parity shall be preserved between dividends and capital expenditures.

It is to be noted that in addition to the total of $135,-

027,364 appropriated for new construction as cited, the corporation had expended up to the end of 1906 $61,480,762 for "extraordinary replacements," some portion of which might fairly be considered as capital expenditure since it resulted in increased capacity of existing plant. With the further total of $114,524,669.44 spent for ordinary maintenance and repairs up to December 31, 1906, the present discussion is plainly not concerned. The fact that stands out in the figures marshaled above is that the replacement of "water" with solid values has made most substantial headway.

The Foundry Apprenticeship Ratio.

The International Iron Molders' Union at its Philadelphia convention, the first in five years, changed the apprenticeship ratio in foundries governed by union rules to one for every five molders. For 35 years the union had maintained as a cardinal law a limitation upon the number of apprentices to one for every eight journeymen, with one additional apprentice for the shop. The only deviation was in the exception made two years ago of members of the Stove Founders' National Defense Association. After some years of ineffective protest by this association against the old ratio, it sent a committee to the Toronto convention of the molders in 1902 to urge special action in behalf of the stove industry. At the same convention President Fox advised "liberalizing the apprenticeship ratio and conforming it intelligently to the needs of a growing industry," urging that such a change "would result in turning out mechanics of greater competency, operate to the material advantage of the union and establish much desired uniformity." But neither the plea of the Stove Founders' Committee nor that of President Fox availed.

Later, the question was submitted to the union membership of making an exception in the case of the stove founders, who had preserved a conference footing with the molders for many years, and had made concessions enough to entitle them to something in return. While considerably less than a majority of the molders took sufficient interest in the matter to express themselves, the vote was strongly against relieving the hardship which a scarcity of competent molders had brought upon the stove trade. Like its predecessor, the administration still favored a change, and at length in 1905, after a long drawn out campaign of education and persuasion, in which the members were made to see that if some disposition were not shown to meet the views of the Stove Founders' Association relations with that organization might come to the breaking point, the officers were authorized to make an agreement giving one apprentice to five stove molders.

The Philadelphia convention, in making the ratio of one to five applicable to all classes of foundries, took no great advance step. Doubtless many who had long held out against any change in the ancient dictum felt that some of the foundations of union power were about to crumble. But the crumbling had already taken place. The one to eight ratio was about as effective so far as representing the general average in the foundry trade is concerned as was the ratio of 16 to 1 in finance, to which a certain platform declaration of 11 years ago gave temporary vitality as a campaign issue. The union had simply repeated its mistake in dealing with the molding machine. After the machine had made its place and had become a revolutionary factor in the foundry trade the union decided that the machine should not be opposed, but should be taken in hand by its good friends, the union molders, and brought to its "best possibilities" of development. The humor of the proposal was so overwhelming that the foundrymen could never be induced to see the serious side of it. In fact, it was the molding machine and the open shop that had saved the machinery foundry trade from feeling the pinch of the one to eight ratio, for it was an easy mathematical calculation that the number of journeyman molders must gradually decline under the old union scheme. The action at Philadelphia on the apprenticeship question is thus not so much a sign that the union is broader and more progressive as that it has quickened its perception of what is going on in the trade in which it has so large a numerical strength. It is safe to say that the Iron Molders' Union would have maintained for a longer time its conference relations with the members of the National Founders' Association had it shown a few years ago even so much as the disposition it now manifests, to catch step with the march of events in the foundry industry.

The day will yet come, unless we are to look for reaction rather than progress, when a union that insists on deciding how many young men at a time may enter the craft it attempts to control will be adjudged as truly opposed to public policy and working in restraint of trade as any pool or combination that seeks to limit the output of shops. When that time arrives the Iron Molders' Union, in convention assembled, may pass another resolution recognizing what has taken place in the world around it.

An interesting instance of the failure of performance to measure up with expectations comes from the experience of many consumers in a Southern State who have been interviewed on the results of apparently important reductions in railroad freight rates which had been brought about by legislative action. It appears that as far as can be ascertained the consumers have realized absolutely no benefit from the reductions in freight rates. The prices which they pay for the articles bearing freight reductions are fully as high as the prices prevailing before the reductions were enforced. The question has been raised as to what has become of the saving in freight rates. It has evidently been appropriated by some of the distributing agencies through which the goods passed before reaching the consumer. If a commission should be appointed in the interests of the consumers for the purpose of locating the point at which the expected saving lodged, that commission would probably find that the reductions in freight rate were so small when they came to be applied to the unit of distribution that the distributing agencies were hardly able to make corresponding reductions in the selling prices of the articles.

A business community with ear strained for the first notes from platforms on which two of the people's servants spoke, while the people waited to know whether the deliverance should be favorable or unfavorable for the country's trade—this phase of the week's developments gives something to ponder on. Whether it be taken to indicate that a new view of the Executive prerogative has actually come into vogue or that a supersensitiveness to Executive influence has taken hold of business, it is significant.

The American Stoker Company, Erie, Pa., manufacturer of automatic under feed and chain grate stokers, has opened an office in rooms 1207-1209 Park Building, Pittsburgh, with H. C. Adam as manager.

Mesaba Miners' Strike Not Completely Settled.

DULUTH, MINN., August 17, 1907.—Strike matters do not look as they did a week ago. The trouble is not over, and while there is no serious anticipation of a conflict, for the reason that the strikers are in the minority among Mesaba range people, something of the sort may come. Many miners are not at work, apparently waiting for the advance in wages that they have been led to believe the companies will soon offer. They are standing around the villages of the range in large groups discussing the situation and doing nothing, contemplating no violence, but waiting for the looked for result. This result, of course, will not come; instead of it the mining companies are beginning the importation of labor. The Oliver Iron Mining Company has already received several hundred men from other fields, and is understood to have many more either on the way or ready to come at short notice. Other mining companies have not yet brought in new men, but will doubtless do so in time, as their need of miners is more urgent than that of the Oliver Company. The men have been deluded by their leaders of the Federation into the thorough belief that the raise in wages and the shorter hours demanded are simply a question of time, and a short time, and that by standing out a few days longer they must win. When these ignorant men find the season growing late, the cool weather coming on, new men in their places and no hope of any increase, they will realize that their leaders have deceived them.

Underground Mines Not Full Handed.

As to the situation at the mines themselves, no underground properties on the Mesaba are working full handed, while at Virginia and Sparta none are working at all. At Eveleth there is very little going on, and at Hibbing the underground properties are turning out comparatively little ore. The surface mines are very busy, with all shovels loading cars as rapidly as possible, so that the tonnage shipped daily is averaging as high as seems to be necessary to fill the requirements of the season, though by no means as high as early season expectations. But at the surface mines the lack of men is shown in the diminution of stripping and other development operations, little being done to uncover ore for the coming year. It was very fortunate that stripping was continued through the last winter so steadily and that so much ore was opened for shovel operations this year, for that has made it possible to continue mining well to the close of this season with slight additional development at these mines. To be sure stripping will have to be active after the close of navigation to prepare the mines for a large output in 1908, and by that time it is expected that the idle men will be back at work, while those now mining can be placed in the stripping jobs.

Active Operations on Other Ranges.

Vermillion range mines are shipping steadily their intended allotments and are not molested; indeed, their shipments will run somewhat in excess of the allotments. The same is true of all old range districts around the lake. This increase has already been referred to briefly in this correspondence. The plan has been to move as great a proportion of stock ore during the strike as railroads running to old range mines were able to move to docks, in order that there might be a free field for the Mesaba as asoon as its own roads could ship up to their capacity.

The Chapin mine is chief shipper of the Menominee range, and of late three shovels have been loading from its stock piles day and night, while the more than regular shipments have been made from shafts, so that this one mine has been averaging for some little time up to 8000 tons per day—a most exceptional showing. Oglebay & Co. have commenced shipments from their new Chatham property in Stambaugh; Pickands, Mather & Co. have cleaned up the ore at their Hemlock mine at Amasa, and have moved the steam shovel to their properties at the eastern Gogebic, where they have in the Mikado mine 660,000 tons to be shipped from stock pile. Rogers, Brown & Co. are shipping from the old Ohio mine, of the western Marquette range, and it has been hoped that a total of 100,000 tons can be forwarded this year. Doubtless this total has even now been modified somewhat. The Ohio lies close to the Beaufort, and has been under more or less exploration for a long time. In the Negaunee District several companies are making improvements looking toward a much larger force of men. Some of these, notably the developments at the Oliver Iron Mining Company's Regent group, have been referred to already. At the Mary Charlotte mine houses for 40 families are being built by the company. At its Rolling Mill mine the Jones & Laughlin Steel Company contemplates the erection of a large number of houses for men. This mine is continually improving in appearance and increasing its force. The company is now completing the installation of a considerable surface plant, and will be in shape another year to make a much larger output than ever before. A dry for 100 men and coal storage for 4000 tons are among the more recent betterments there. The work of the Cleveland-Cliffs Company in building a town at Princeton and the operation of the Empire mine by Oglebay, Norton & Co. have been mentioned, and are referred to here simply as an indication of the activity prevailing in that general portion of the Marquette District, where about as great changes are now being carried on as anywhere on Lake Superior, the Mesaba and Menominee not excepted.

Explorations on the Western Mesaba.

Drilling operations are quite active now west of the Mississippi River, on the Mesaba range in townships 55-25, 55-26 and 54-26, and 54-25, west of the third guide meridian. Reports come in of depths of ore cut running up to nearly 100 ft. under a considerable thickness of drift. The ore found is of quite poor grade, however, and results there are still problematic. Several heavy interests are at work, including the Oliver Iron Mining Company. This work will necessarily be slow and costly, as there are few guides to the possible presence of iron ore, and the drift is of much thickness in places. Still 100 miles further toward the west, in Otter Tail County, and on the general strike of the Mesaba range, projected in that direction, parties representing Duluth mining men have been taking options on lands from farmers and State mineral leases on considerable tracts, and the supposition is that they have taken these for exploration for iron ore. This will be by no means the first time that such explorations have been conducted on that region, but heretofore all the developments found has been mere glacial wash and morainic till, carrying fragments of the iron region to the north and east.

Whether the present explorers have any more sure foundation for their operations remains to be seen, and it will undoubtedly be a long time before anything definite can be known. Rogers, Brown & Co., who recently took a property on Rabbit Lake, Cuyuna District, in Crow Wing County, have taken another close by, and have paid money for it. They are sinking an exploratory shaft on the first property and expect to prove them both by it. In this connection one might note that the magnetic iron ore deposits of the northeastern part of the State, continuing the Mesaba and Vermillion districts, seem to be utterly dead, so far as exploration or interest is concerned, and that is a far more inviting field than either Otter Tail or Crow Wing counties.

The furnace of the Atikokan Iron Company, at Port Arthur, Canada, is now making about 80 tons per day, or not quite to its capacity of 100 tons, of a No. 1 foundry pig iron from all Atikokan magnetic ores, with no indications of excessive sulphur in the pig. A company called the Dominion Bessemer Ore Company, Ltd., has been organized to control the banded hematites east of Port Arthur, that were so extensively heralded last year, but that do not seem yet to have caused such an interest in the mining world as their claims should command.

D. E. W.

The Nonmetallic Impurities in Steel.

Investigation by E. F. Law, London.

The Iron and Steel Institute has just published its second volume of proceedings for 1907. It consists almost entirely of reports of work carried on by the Carnegie research scholars. For the research on the subject given above E. F. Law of London was awarded the Carnegie silver medal. It is a subject growing in importance. Very recently Dr. P. H. Dudley, in his paper before the American Society for Testing Materials on Limber and Stiff Rails, again called attention to the presence of slag in rail steel. He showed there how the slag threads in the heads of the rails constituted lines of weakness, and under the present day heavy loads developed either into split heads or caused the rails to flow easily instead of resisting the abrasive action. In England the presence of so-called "greenish colored markings" on the fracture of test pieces has aroused considerable interest; these markings, which are due to slag, having been found in the highest quality gun-forgings from steel made with every precaution.

Mr. Laws Investigations.

The author of the paper under review, Mr. Law, has for some time carefully examined every unsatisfactory steel submitted to him, and has found the number of failures due to the presence of slag or foreign matter to be quite as large, if not larger, than those due to improper heat treatment, mechanical treatment, or any other cause.

The nonmetallic impurities include silicates, sulphides and oxides, and may be conveniently referred to as slag. This term is not strictly accurate, but may be employed, provided it is understood that by the word "slag" we do not necessarily refer to any of the ordinary slags produced in the process of steel manufacture. Phosphide of iron can hardly be included, as it is soluble in iron. However, on account of the occasional marked segregation of the phosphide, its behavior is somewhat similar to the other impurities, as it destroys the homogeneity of the steel.

The chemical method of examination for slag is extremely unsatisfactory on account of the small quantity of residue obtained and its complex composition. The method of dissolving the steel in a solvent, such as bromine, iodine or copper ammonium chloride, and analyzing the residue was found preferable to volatilizing the metal by passing over it a stream of chlorine.

By combining microscopical with the chemical methods it is possible to gain an insight into the character of the included matter. For microscopical investigation the author recommends polishing the specimen as completely as possible, and before etching thoroughly examining with both low and high powers. Afterward an etching may be employed to reveal the nature of the metal in the neighborhood of the impurity, and any change which may have been caused by its presence. Microscopical examination shows that in commercial steels no fewer than five distinct impurities may be present—namely:

Sulphide of iron.
Sulphide of manganese.
Silicate of iron.
Silicate of manganese.
Oxide of iron (or possibly oxide of manganese).

It must be understood that these do not occur in a pure state, but their composition is essentially that of the compounds named.

Sulphide of Iron.

This impurity is rarely found in commercial steels and is only present when the sulphur is very high and the manganese low. When it does occur it is usually found with and often completely surrounding the manganese sulphide. It is a pale yellow in color, and therefore difficult to photograph. It may safely be said that iron sulphide should not be present in steel.

Sulphide of Manganese.

This is invariably found in steel and is the form in which sulphur occurs in all good steels. Under the microscope it is seen as pale slate or "dove gray" patches, more or less elongated in the direction of rolling. It can be easily recognized if occurring in large enough patches by covering the surface of the specimen with a coating of gelatine, containing an acid solution of a lead or cadmium salt. The acid decomposes the sulphide with the formation of sulphuretted hydrogen, which gives rise to a deep brown or yellow stain of lead or cadmium sulphide.

As a rule it is not broken up, but rolled into long, thin threads, which certainly points to the fact that it has a lower melting point than iron. The sulphide occurring in steel varies very much in color and composition. In some steels it is so pale that it is difficult to photograph, whereas in others it is so dark that it may easily be mistaken for manganese silicate. The lighter colored sulphide may be due to there being a certain amount of iron sulphide in solution. It also frequently occurs with manganese silicate, from which it may be dissolved out with dilute acid.

The effect of manganese sulphide on steel appears to be less injurious than the other impurities, and when it is present to only a moderate extent and evenly distributed through the steel, its influence may be neglected. When segregated together with phosphide of iron, in the form of ghosts, it may have a very injurious effect upon steel.

Manganese Silicate.

This is similar in color to the sulphide, but somewhat darker, while iron silicate is very much darker, and always broken up by rolling. Iron silicate is merely the entangled slag. These silicates have a decidedly injurious influence upon steel, and the author's experience leads him to believe that they occur far more frequently and are responsible for more failures than is generally supposed. Chemical analysis reveals nothing, and a number of samples have recently been under examination whose failure was solely due to the presence of silicate, although the analysis gave no indication of this. A microscopical examination, however, at once reveals its presence and shows, moreover, that it does not occur in isolated patches, but distributed throughout the mass.

Oxide.

This constituent occurs in the form of minute black specks, distributed throughout the mass of metal. These can only be seen if the metal has received a perfect polish and require a magnification of at least 1000 diameters. Occasionally these specks are found grouped together to form larger patches. They are more often found in Bessemer than in open hearth steel, and the author has invariably found them in steel sheets, which produce blisters when pickled in acid.

The chemical method adopted for the estimation of the oxygen was similar to that suggested by Ledebur more than 20 years ago. The steel was obtained in the form of very fine drillings. These were then transferred to a combustion tube and pure, dry nitrogen passed until the air was driven out. The tube was then heated to a full read heat, maintained at this temperature for some time, and allowed to cool, the stream of nitrogen passing all the time. When the tube had cooled down the nitrogen was replaced by pure, dry hydrogen, and the temperature again raised to a bright red heat. The object of the ignition in nitrogen is to remove occluded moisture and any oil which may have been accidentally introduced. It was found to be absolutely necessary. The ignition in pure, dry hydrogen formed water, which was absorbed and weighed.

A complete examination of a number of steels was made as follows: A piece of the bar was cut up and rolled into 24 sheets, which were carried through the usual pickling and annealing process, and the number of blistered sheets was noted. An adjacent piece of the bar was analyzed, examined microscopically, and the oxygen determined. The most interesting results are given in the following table, and for comparison the

oxygen in a basic Bessemer steel before the addition of ferromanganese is also given:

No.	Description.	Car.	Sil.	Sul.	Phos.	Man.	Micro-scopic.	No. sheets blis-tered.	Oxy-gen.
1.	Acid	0.141	Trace.	0.106	0.188	0.32	Bad.	7	0.026
2.	Bessemer	0.181	Trace.	0.076	0.070	0.35	Good.	0	0.022
3.	Bessemer	0.131	Trace.	0.061	0.049	0.34	V. Good.	0	0.021
4.	Bessemer	0.136	Trace.	0.061	0.081	0.35	Bad.	9	0.032
5.	Basic	0.103	Trace.	0.045	0.075	0.47	Bad.	8	0.034
6.	Bessemer	0.100	Trace.	0.080	0.066	0.43	Fair.	6	0.026
7.	Bessemer	0.146	Trace.	0.101	0.126	0.48	Fair.	4	0.025
8.	Bessemer	0.117	Trace.	0.071	0.090	0.48	V. Bad.	19	0.046
9.	Bessemer	0.132	Trace.	0.069	0.034	0.38	Good.	0	0.021
10.	Bessemer	0.106	Trace.	0.079	0.098	0.44	Bad.	7	0.027
11.	Bessemer	0.117	Trace.	0.080	0.068	0.45	Bad.	12	0.030
12.	Blown metal.	...	...	...	...	...	...	..	0.062

The results certainly show that the steels giving the greatest number of blistered sheets contain the most oxygen.

At first sight it appeared that the quantities present are extremely small, but on further consideration it will be seen that this is not so, for we have to consider the quantity of the combination of these elements which influence the quality of the steel. For example, 0.05 per cent. of oxygen corresponds to 0.22 per cent. of ferrous oxide.

Corrosion.

Oxide of iron differs in one respect from all the other impurities found in steel, and the results of this difference are of far reaching importance. The difference referred to is the influence exerted on the corrosion of the metal. If polished specimens are kept side by side in an ordinary room those containing oxide begin to show signs of rusting long before the others, and in dilute acid solutions they corrode far more readily.

The explanation of this is that all impurities, with the exception of oxide, are electronegative as compared with iron; the result is that a small electro motive force is set up, which assists the solution of the impurity, this leaving pits in the steel. In the case of oxide, however, the action is reversed. It is electro positive as compared with iron, so that the electro motive force causes the steel in the neighborhood of the oxide to be dissolved. Moreover, as the oxide is not itself dissolved there is nothing to hinder the action until the oxide is removed by mechanical means.

The corrosion of welded bars constitutes cases in which the oxide may be said to be introduced artificially, but the results are equally serious when the oxide is introduced in the process of manufacture. G. B. W.

The Washington Tin Plate Company.—J. J. O'Connor, formerly secretary and treasurer of the McClure Company, Fourth avenue, Pittsburgh, jobber in tin plate, sheets, metals and tinners' supplies, has sold his interest in that concern and has purchased the entire plant of the McClure Company at Washington, Pa., manufacturer of tin and terne plate. A new company has been organized with a nominal capital of $10,000, which will eventually be increased to $300,000, with Mr. O'Connor as president and Richard W. Martin, secretary and treasurer. The management of the plant will continue as heretofore, but some material enlargements and additions to equipment are intended, plans for which are now under way. A 15-ton electric traveling crane will be installed, the contract for which has not yet been placed. The plant contains five stands of hot mills and three stands of cold mills, the monthly capacity being about 25,000 base boxes of tin and terne plate. It is the intention of the new company to market its entire product through jobbers, and special attention will be given to the manufacture of a very high grade of roofing plates.

The Magee Coke Company has been organized at Pittsburgh with a capital of $100,000. W. C. Magee is president; J. W. Abraham, vice-president; I. W. Seamans, treasurer, and C. S. Bygate, secretary. The company's coal property is located in Mt. Pleasant Township, Westmoreland County, Pa.

To Test Labor Union "Unfair Lists."

James W. Van Cleave, president of the Buck's Stove & Range Company, St. Louis, Mo., filed a suit at Washington, August 19, in the Supreme Court of the District of Columbia, asking that the American Federation of Labor and its officers be restrained from the use of the "unfair" and "we don't patronize" lists. Samuel Gompers, president of the Federation, and the other officers are named as defendants. Mr. Van Cleave brings the suit as an individual, but it is stated that he has the support of the National Association of Manufacturers, of which he is president, and of other organizations. The suit is the beginning of a movement to prevent the use of the boycott against persons or companies falling under the displeasure of union labor. It will be contended that an order projecting a boycott or the enforcement of the boycott is a conspiracy within the meaning of the Sherman anti-trust act.

The immediate provocation for the suit just filed was the action of the executive council of the American Federation of Labor in putting tne Buck's Stove & Range Company on the unfair list. This was done some time ago. The labor leaders allege as a reason complaints against the company made by some of its employees. Like other members of the Stove Founders' National Defense Association the Buck's Stove & Range Company has been governed by the decisions, as to wage and other labor questions, of joint conference committees representing that association and the International Iron Molders' Union.

In a newspaper interview Mr. Van Cleave says he was singled out for attack by the boycott because he has always been a pronounced advocate of the open shop and particularly because he is president of the National Association of Manufacturers and of the Citizens' Industril Association of St. Louis, both of which stand for the open shop. The only unadjusted grievance presented by employees of his company is that of the union polishers who quit work last year because of the 10-hr. day; but, he argues, the men are paid by the piece so that they earn just that much more money in 10 hr. than in nine. However, the union insisted that the output be limited. Mr. Van Cleave added that the company has no trouble with the Iron Molders' Union, but that the boycott was instigated by the Brotherhood of Foundry Employees, an organization which so far as he knows never had a member working in the foundry of his company. The boycott was also established contrary to the rules of the American Federation of Labor, which require a thorough investigation by officers of the Federation. No representative of the Federation has ever made any inquiry of the company concerning the facts in the case. Further, every workman in every department of his plant, Mr. Van Cleave says, is opposed to this boycott upon the products of his own labor.

On any hand power operated apparatus, such as a small jib crane, requiring a considerable exertion on the part of one or more men, the location and throw of the crank become important. Experience has shown that for the average laborer a hight of shaft of 32 in. above the ground or platform, with a throw of 32 in. provided by a crank arm of 16 in., is satisfactory. For an operation requiring only light exertion the crank length might be made only half this amount, and the crank shaft located 40 in. above the floor level. This would permit a much more rapid rotation of the crank, even though the load on the larger crank might in cases be as light as on the smaller.

A large hydraulic dredge completed for the commissioners of Lincoln Park, Chicago, has a capacity of 1500 cu. yd. per hour. It digs to a depth of 33 ft., making a clear cut 175 ft. wide. The cutter is 7 ft. in diameter, and is provided with 10 blades, being supported upon a 50-ft. frame carrying the suction pipe. It is driven by a double tandem compound engine with cylinders 10 and 20 by 18 in. The material is handled by a 30-in. centrifugal pump, driven by a triple expansion engine.

The Rolling of Sheet Copper.

Characteristics of Sheet Copper Mills.

BY COPPERMAN.

In this article it shall be the endeavor of the writer to describe, first, the style of rolling mills used, and, second, the general methods of the copper rolling companies in the manufacture of sheet copper. Very little descriptive of these has been published, and it is hoped that the following may prove of interest to both the copper and the steel mill man.

Conservatism of the Trade.

From the engineering papers the copper men can keep in touch with progress made in the making of sheet steel, but they have been backward about trying anything new that did not originate from their own ideas. It is only of late years that builders of steel mill machinery have had much chance to bid on mills for rolling copper, but they are now taking a good quantity of the business away from old time builders of copper and brass mills.

Let it be said in the beginning that the manufacturers of sheet copper have much to learn from the steel mills, particularly regarding scrap and the time required to get an order through the mill. There is a percentage of scrap on sheet copper that would be positively prohibitive in a sheet steel mill. The amount of money represented by the value of one-half of it as a salable product over its actual value as scrap for refining or brass casting purposes would be a large saving. Lack of records is a deplorable fact, but where a close record is kept the percentage of scrap from cast cake to shipment will be from 30 to 40 per cent. on soft roofing and cold rolled cornice copper.

From this statement it is seen that there must be a chance for improvement, which will be better understood when the methods of rolling are described. Any concern organizing for the manufacture of sheet copper should bear this in mind in the design of its mill and the plans for operating, for this high percentage of scrap can certainly be reduced considerably.

Mills are trying hard these days to increase the output per pair of rolls, and also to get the orders through the mill faster. This makes not only a quicker delivery, but lowers the inventory or quantity of metal in process, which soon ties up a large working capital if not closely watched.

There have been instances of copper mills hiring steel rollers, expecting to roll copper the same as sheet steel. These have been failures for various reasons, due mostly to the entirely different nature of the two metals. In order to get a roller to try the job, they have either had to pay him wages much higher than they pay their own rollers, or else take a poor roller who has not the skill, tact or patience to make good. As a rule, he gets mighty poor backing, especially in getting his mill fixed as he wishes, and he soon gives up in disgust. On the other hand, there have been a few cases of at least partial success, where a good man was given a proper show and where he was eventually able to get along on a compromise basis between sheet steel and old-time copper rolling methods.

The Usual Type of Copper Mill.

The mills are of the counter-weighted top roll type, with a very few friction mills, the latter not being as well liked as the former, principally because they are not understood. There are also late installations which include a universal mill and a three high, both of these being new to copper mills. Roll sizes range from 20 in. x 42 in. as the smallest up to a few quite large mills—28, 33 and 34 in. in diameter up to 152 in. in length for rolling large brazing sheets and circles used mostly in making vats, tanks and kettles for distilleries. The average sized mills for finishing is 20 x 60 in..

Compared with the sheet steel mills, the equipment is of much lighter build, the housings being all cast iron, with a few cast steel pinions and spindles, and the rolls longer in proportion to their diameter with smaller necks, the latter being 13 to 15 in. for 20-in. and 22-in. rolls, 16 to 18 in. for 24-in., and 20 to 22 in. for the large 30, 33 and 34-in. rolls. Some of the later mills built in the Pittsburgh district are strictly of steel mill pattern, and of sizes approximating 22 in. x 60 in. In many of the older mills the brasses are round on the outside, held in by keys or tap bolts through lugs, with as high as 160 degrees arc of contact. This gives no chance to line up a low mill except by shims under the housings, and the large arc of contact is a waste of metal as well as a cause for hot necks when the brasses wear down thin. Side brasses are found on Pittsburgh built mills only.

Water is piped to each pair of rolls, and a stream run constantly on the necks. After a heat of cakes is rolled, or bars roughed, a perforated pipe or metal trough is put across the top roll, and the rolls are cooled off to a dead cold on breaking down rolls and almost cold on finishing rolls. This use of water is one great difference between the practice in steel and copper mills, and calls for a lower chill and different shaped roll surface. Where the steel mill uses a hollow or concave roll, no water on the surface of the roll, and little or none on wobbles or necks, and a heavy neck grease, the copper rolls are flat, or more often crowned, and the rollers get along with a soft grease. It may be stated here that an all-day gang of three 8-hour shifts on rolls is unknown, and a night gang is run only in case of excess orders, or emergency.

Features of the Rolls.

Most mills have a roll lathe and a grinding lathe for redressing rolls. Turning in the housings is not practiced, except where a steel roller, who can turn also, gets on a mill. Usually the rolls are "ground" by the use of a wood block and emery by the roller himself, and fixed to suit his particular idea. This takes from one to four days in about every two months, and a new roll when put in is nearly always ground. If the builders of steel mill rolls, when making rolls for copper mills, unless ordered to furnish cross turned rolls, would send them straight, it would save a good deal of labor for the roller.

It is a fact that one firm making copper rolls always furnishes them crowned, going as high as 0.015 in. on the diameter of a 20 x 60-in. roll. A copper mill ordering rolls for the first time from a steel mill roll maker will probably not specify as to shape, and unless the maker has had previous experience with some other copper mill, he sends hollow turned rolls, which often break on the first few heats.

Two distinct methods of drive are used. One is a direct drive from pair to pair, with the engine near the middle, driving by reducing gears the entire train at the same speed, with breaking down rolls next to the engine and cold rolls on the ends. In the other method the brass mill drive is used. The engine is connected by ropes, belt or gears to a cellar shaft running nearly to the extremes of the train, with pinions and gears at intervals to drive sections of usually four or six pair rolls, two pair rolls to one pair pinions. This is a good installation in many respects, permitting different speeds, easier line up, and, in case of breakage, shuts down only a small part of the plant. On the other hand, the first cost is higher, and the friction load is in excess of the direct drive. In mills with the underground shaft the friction load will run from 12½ to 15 hp. per pair rolls.

In directly driven mills the line up is usually neglected, the backlash often making it necessary for rollers to watch each other and not stick their bars or packs the first few passes at the same time. A breakage, with two to four pair rolls, with pieces or packs in, and a loss of time of 3 hr. on six pair rolls, is no exaggeration. A properly lined up train, as understood by the sheet steel or tin plate man, is a thing that the copper mill master mechanic knows nothing at all about, and it would be a lesson to him to go into some large steel mill, such as the Apollo Works of the American Sheet & Tin Plate Company, and see a long train of rolls in operation.

Speed of rolls varies somewhat in the different plants, but as a rule 20, 22 and 24 in. mills run at about 35 rev. per min. For finishing packs, a 20 in. mill at 35 turns,

or a 22 in. at 33, will be found very satisfactory. The large mills run at widely different speeds, from 30 in. and 34 in. at 18 or 20 turns, to 33 in. and 34 in. at 37. This latter is entirely too high for good work, and such speeds have been the result of putting in mills without any consideration of the knowledge of the men who have to work on them.

Processes of Rolling and Finishing.

In describing the making of sheet copper, the processes will be taken in the order in which they occur, namely, breaking down, roughing or slabbing, trimming, finishing, annealing, pickling, cold rolling and stretching. Soft copper drops out after either annealing or pickling, shearing taking place as given below. No mention will be made of tinned, cold rolled annealed, or polished copper, but all work spoken of will be that which applies to braziers' copper, plain soft and plain cold rolled sheet for cornice purposes.

Breaking Down, Roughing or Slabbing.

Breaking down is the rolling of the cakes into sheets of specified widths, dependent on the finished size, by a thickness of about ¼ in., or thicker on heavy cakes. Cake usually comes 14 x 16 in. at 200 lb., or 18 x 18 in. at 240 lb., and heavier ones 18 x 18 in. up to 48 x 48 in., keeping the thickness about 4 in. Stock for heavy circles is octagonal shaped, thus saving scrap, and making an easier cake to handle. Heats for breaking down run from 14 to 18 cakes per heat, 8 to 10 heats per day, averaging eight heats of 16 cakes, or about 30,000 lb. per 10-hr. day. These are handled by a crew of six to eight men, at a rate total of $13.50 to $15 per day.

In mills where the finishing rollers do their own roughing, the broken down cakes are cut after each heat on alligator shears into bars, supposedly 2¾ to 3 lb. over the roller's weight, and distributed to the different rolls. This is done usually by the breaking down gang at no extra wages for shearing. In a mill where slabbing is done, some of the sheets are cut in two, and others sent whole to the rolls, and run down or slabbed in one heat to about No. 15. Thence they go to the shears to be trimmed to width and weight, and sent to the finishing rolls.

Trimming, Finishing and Annealing.

In the case of cut bars, the pieces are reheated, roughed down by pairs to about No. 16, trimmed all around to exact width and weight, and returned to be packed and finished off.

The sheets trimmed from slabs are much more uniform in weight than those trimmed from roughed pairs, as in the latter instance, to save time and labor at the shears, the two pieces are trimmed together to double weight. If one of the bars making up the pair were light and the other heavy, as is often the case, the result is a light and a heavy sheet, with the combined weight of the two equal to twice the correct weight for one. This style of trimming is responsible for the fact that jobbers, selling broken lots, will find 13 ounce and 15 ounce sheets in a 14 ounce case, but the variation is not noticed by the roofing man who buys in quantity, and goes by the weight and total number of sheets shipped him.

Finishing packs made from slabbed pieces usually take two heats on 96 in. long, as the pieces are not shaped to the rolls, and the latter are practically cold, there having been no roughing of bars to warm them up. Packs made up from pieces roughed on the same roll, can easily be finished off in one heat as thin as 14 ounces, 96 in. and even 120 in. long, if the rolls are in prime condition.

Annealing is done in two different ways. In one the packs are charged by hand, one at a time, into the furnace up to its capacity, and when red hot, are pulled out and the tail end stuck into a water vat built under the furnace. In the other, the sheets are painted over with, or dipped into, a solution, and put into the furnace singly, up to the full width of the hearth, one sheet deep. These get hot quickly, are pulled out and plunged entirely in the vat. This skins the scale or oxide off the sheet, leaves it a nice red color which depends somewhat on the temperature at which the water is kept, and is always spoken of as "scaling." This is the method by which all braziers' sheet and circles are annealed.

Scaling in water removes a considerable percentage of the original weight of the sheet, as oxide, which is left in the pit for several months, when it is shoveled out and sent to the refinery, or dried, run through a magnetic separator and sold as copper scale. The annealing by pack method leaves but a small amount of scale in the pit, but it is taken off by the pickle where it forms copper sulphate in solution. Some of the more progressive companies are now making blue stone in large quantities from the saturated pickle, while some are still throwing away thousands of dollars yearly.

Pickling.

From the annealing furnaces, the sheets go to the pickle tubs and are put, one at a time, on a rack immersed in a tub of diluted sulphuric acid of proper density, where they remain until the oxide is removed. The rack is then hoisted out of the pickle and lowered into a cold water tub from which the sheets are pulled out singly and passed through some form of drying and scouring machine. In some plants the sheets are turned by hand, one by one, from a weak pickle into a stronger one, before going into the water tub; but this is a waste of labor, provided the annealing has been done properly.

The quality of sheet copper, especially cold rolled, depends much on the thoroughness of the scouring and drying out process. The scouring must be well done by the rotating brushes and flushed at the same time by a strong stream of water, passed between rubber rolls to squeeze all the water off the top and bottom of the sheet, and finally go through some form of heater. If the sheets come out thoroughly dry and hot, they can be loaded at once on wagons to go to the shears or cold rolls. If not dry, they must be stood up on the floor to dry, otherwise when piled up they will turn black in spots.

When cleaned, soft copper sheets are taken to the flattening block, a rectangular piece of smooth cast iron, about 60 x 100 in. and 2 in. thick. They are piled up, one by one, with the edges smoothed out where necessary to prevent marking, until there are about 30 sheets in the pile. Over these an old sheet of copper is thrown, and the pile is flattened or spanked with a "spanker," a block of hard wood about 8 x 12 in. attached to a curved handle. Crude as this method appears, there has been nothing devised, so far, to better it. When flat, the sheets are sheared to size, boxed and shipped.

Cold Rolling.

Sheets for cold rolling, after being cleaned, are sheared all round, about 1 in. being allowed on the width, and up to 2 in. on the ends, so that they may be cold rolled out to the finished length plus 4 in. Sometimes the sides are sheared or slit before they pass through the pickle, helping to keep cold rolled and soft copper lots separated.

The cold rolls are again radically different from steel mill cold rolls. Where the latter are friction mills with two screws to the housing, sledged down tight, the former are plain loose mills with usually 20 x 60 in. crowned rolls, with the screws never down dead tight. The sheets are rolled two to four to the pack, depending on gauge, and are started with the roll up so as to work the middle out on the first pass. They are then shifted after about the second pass, so as to bring the surface of each in contact with the rolls. Sheets to shear 96 in. long are commonly cold rolled 3 or 4 in., from a sheared length, soft, of 97 in. or 96 in. respectively, out to 100 in., which allows 4 in. end trim. Sheets shorter than 100 in. are rolled in the same proportion, or a temper of 3 or 4 per cent. If the cold rolling exceeds 5 per cent dry temper, the metal is liable to crack in double seaming, but 5 per cent. gives a much nicer looking sheet than 2 or 3 per cent.

Many sheets are spoiled in cold rolling in some mills due to the improper shape of the roll, poor labor, variation in gauge of the sheet as they come from the hot rolls, or a combination of all three causes.

Stretching and Shearing to Size.

As they come from the rolls the sheets are not flat, but are full of waves, and are pulled flat on a stretcher. This consists of a set of jaws, adjustable for different

lengths at one end of a cast iron frame, and another set of jaws attached to the piston rod of a hydraulic cylinder. A good man on the stretcher can pull almost any badly cold rolled sheet flat, if its temper does not exceed 5 per cent., by proper adjustment of the blocking which supports the middle of the sheets. Stretching is usually done on three or four sheets at a time, on 14 and 16 ounces, and the jaws mark up about 1½ in. on each end of the sheet.

The last operation is the shearing to size, commonly done on the sides, two sheets at a time, on one pair shears, and cut to length, one at a time, trimming off the stretcher marks on both ends on another pair.

The Processes Illustrated.

As an illustration of the processes described, we will consider the making of a heat of 16 200 lb. cakes into 30 x 96 in., 14 ounces C. R., 2 per cent. light, as it is customary to keep the sheet on the light side. This will result in about 17⅛ lb. each to the finished sheet, or a gauge of about 13¾ ounces.

The hot rolled size, 32 x 100 in., calls for a roller's weight of 21 lb., which allows for scale and loss in 3 in. of end shearing. The cakes are broken down to 32½ in. wide, and cut into bars of 21 + 3 = 24 lb. each, which allows for trimming all round, after roughing down, to 32 in. wide by 21 lb. On 200 lb. cakes, the rolling to width and bar cutting must be done very accurately to get eight bars to the sheet. We shall assume that the heat of 16 cakes will cut into 125 bars only, of 24 lb. each, a bar weight of 3000 lb., or 93¾ per cent. of the 3200 lb. cake weight, a scrap of 6¼ per cent. Again, these 125 bars roughed down and trimmed to 21 lb. gives a hot rolled sheet weight of 2625 lb., equaling 87½ per cent. of the bars, or only 82 + per cent. of the cake weight.

Provided the entire lot of 125 sheets go through without any spoiled at the hot rolls, drying out machine, or cold rolls, and shear up to an average of 17⅛ lb. each, the shipping weight will be 2140 lb., which is 66⅞ per cent. of the cake, a scrap total of 33⅛ per cent.

As a matter of fact, in everyday work in the average mill, three rollers out of five will spoil at least one pack in the 25 at the hot rolls, and if there are not more than six sheets out of the 120 left spoiled at the cold rolls, the rollers will be keeping within ordinary results.

This leaves for shipping 114 sheets, a total of 1952 lb., or 61 per cent. of the original heat of 3200 lb. This shows a scrap of 39 per cent., a percentage not in the least uncommon, if records be kept on this class of work.

Think it over, copper mill men, and ask your sheet steel friends if they could stand for this loss.

Strength of Malleable Castings.—The tensile strength and elongation of malleable iron castings are not accurately known to designers in general. In a paper before the Scandinavian Technical Society, definite information was given recently as to the properties of malleable cast iron as made in the peninsula; which information is doubtless applicable as well to American irons. The paper gives the tensile strength as between 40,000 and 50,000 lb. per square inch. It has an elongation, varying with different samples, from 1 to 6 per cent., with a reduction of area at the breaking point of from ¾ to 3 per cent. It is thus seen that the ordinary grade of cast iron, having a tensile strength of only 20,000 to 30,000 lb. per square inch., is but about half as strong as the malleable castings; though its compressive strength is much higher. Malleable cast iron shrinks more in the mold than does ordinary cast iron, but during the process of annealing a slight swelling takes place. If malleable castings have to be straightened by hammering, nothing is gained by heating them, the ordinary surrounding air being of a satisfactory temperature for this purpose.

Shafting Strains.—Shafting is subjected to two important strains—torsional and transverse. Close observation leads to the belief that of the two, the transverse strain should be guarded against more carefully than at present practiced, as it is responsible for many shafts that are broken. The torsional strength of shafting, or the resistance to breaking by twisting, is proportional to the cube of the diameter (in hollow shafting, it is proportional to the difference between the fourth powers of the external and internal diameters, divided by the external). The transverse strength, or resistance to bending, is proportional to the fourth power of the diameter, and varies inversely as the load and as the cube of the distance between points of support. Head shafts carrying receiving pulleys, rope wheels or gearing, should be enlarged or swelled, so that the bottom of the key seat in the shaft will not come inside the diameter of the body of the shaft.

Labor Notes.

The New York Central Iron Works Company, Geneva, N. Y., recently obtained an injunction restraining union workmen who had left its employ from interfering with the company's employees who took their places. On behalf of the union affidavits were filed in support of a motion to dissolve the injunction. This motion was denied by Justice Clark, who gave an opinion dealing at some length with questions relating to picketing. Various authorities were cited, but stress was put upon the decision given in the case of the W. P. Davis Machine Company, Rochester, N. Y., against machinists who left its employ. It was held that the Rochester and Geneva cases were strikingly similar. It was shown that the men picketing the shops menaced the nonunion workmen, calling them "scabs," saying that they were depriving the strikers of their bread, and warning them that if they entered the works they were going to their death. The court said further that when combinations of striking employees amount to conspiracy, having for their principal object the destruction of the business of a former employer because he would not concede their demands, they cannot be upheld. In the opinion of Justice Clark the Geneva defandants attempted to interfere with and destroy rights of both employer and workmen, and it was said in conclusion: "If that was not their purpose then this injunction can do them no harm; if it was their purpose then the continuing of the injunction will prevent them from doing the plaintiff any harm."

Reports that Mackintosh, Hemphill & Co., Pittsburgh, had granted the demands of their striking machinists are untrue. William H. McFadden, vice-president of Mackintosh, Hemphill & Co., has made the following statement regarding the matter: "Mackintosh, Hemphill & Co. authorize the statement that their former machinists returned to work at the same wages that they had received when they went on strike, and that no other concessions were made, and none are contemplated, excepting that the merit of the individual man will be recognized according to skill. Other manufacturers interviewed state now, as they did 15 weeks ago, when the men walked out, that the demands made were not then and are not now warranted or possible, and that the general advance made in wages in April last, is all that competitive business conditions will permit."

An agreement has been reached between the Pittsburgh Coal Company and the United Mine Workers of the Pittsburgh District, and 2000 miners who have been idle for several weeks have returned to work.

Since the exhaustion of the natural gas supply in Indiana for use in a large way it has continued to be the domestic fuel for the smaller towns, especially those in the heart of the gas fields, and it has supplied the smaller factories in the gas belt and is still supplying them. However, the wells are continuing to give out and the supply to become constantly smaller. Companies that have to discontinue business find the old mains and pipes a valuable asset. For example, the Columbia Gas Company of Hancock County, which is filling up its wells, gets as much as $200 for the pipes in one well, and mains that cost 45 cents a foot when laid 16 years ago are being sold for 60 cents a foot after all those years of service.

NEWS OF THE WORKS.

Iron and Steel.

The Jefferson Iron Company, Jefferson, Texas, expects to start up its blast furnace at an early date. Heretofore charcoal iron has been made, but the furnace will now be operated with coke as fuel. The output will be about 100 tons a day. Marion County, Texas, ores are to be used.

The large machine shop which the New York State Steel Company is erecting at its plant on Abbot road, Buffalo, N. Y., is nearing completion, and it is expected will be in readiness for occupancy by September 1. Work on the company's new blast furnace is also progressing favorably, and it is hoped to have it completed and in operation early in 1908.

The Pittsburgh Steel Company, which is now building an open hearth steel plant at Monessen, Pa., where its rod and wire mills are located, to contain 12 50-ton open hearth furnaces, has placed a contract for a 42-in. blooming mill with Mackintosh, Hemphill & Co., Pittsburgh. The Pittsburgh Steel Company has recently bought a good deal of additional ground at Monessen other than that which will be occupied by the steel plant, and it is understood that some additional mills are contemplated to roll other lines of product.

The Crum Lynne Iron & Steel Company's plant at Crum Lynne, Pa., was sold August 15 to a group of Philadelphia capitalists represented by J. C. Taylor. The purchasers will take immediate possesion and manufacture steel bars by a new process.

The new plant of the Ohio Rail Company, Newark, Ohio, was put in operation last week, and the company is now prepared to roll sections from 16 to 40 lb. The main office of the company is in the Park Building, Pittsburgh.

Press reports to the effect that the Carnegie Steel Company proposed to make additions to equipment at the Sharon works, South Sharon, Pa., including a large number of open hearth furnaces, have been officially denied. No plans for extensions or additional equipment to be installed in these works are under way at the present time. This also applies to the report that more open hearth furnaces are to be added to No. 4 plant at the Homestead works of the company.

The furnace of the Detroit Iron & Steel Company, which has been out of blast for repairs, was blown in August 17.

General Machinery.

McLeod Brothers, makers of automatic scales and packaging machines, have been induced by the Business Men's Association of Davenport, Ill., to remove their factory from Peru, Ind., to that city. Quarters have been secured in the second floor of the S. R. White Mfg. Company's building for the accommodation of the business. Most of the machinery required for immediate use has been purchased, but it is expected that additional equipment will be needed in the near future. The firm hopes to complete the work of removal and be ready for operations in the new location by September 1.

The Chain Belt Company, Milwaukee, Wis., which is now making a $45,000 addition to its plant, has also arranged to build a restaurant to cost $5000 for the benefit of its employees. The workmen will thus be enabled to buy their meals at cost and have them served under pleasant conditions.

The H. B. Smith Company, Westfield, Mass., manufacturer of boilers, heaters, radiators, &c., has completed an addition to its foundry, 20 x 30 ft.

The Birmingham Iron Foundry, Derby, Conn., has increased its capital stock from $150,000 to $300,000, the company having decided to convert some of its surplus into stock.

Owing to the rapid increase of its business, the Armstrong Bros. Tool Company, 109 N. Francisco avenue, Chicago, has been compelled to make further additions to the large modern plant it erected about two years ago. These consist of two buildings of steel and brick construction, one 50 x 105 ft., and the other 40 x 105 ft., with a brick chimney 60 in. in diameter and 115 ft. high. In these buildings the company is now installing a modern power plant consisting of two 150-hp. water tube boilers equipped with automatic stokers, direct connected engine and generator, and a drop forge department of large capacity with steam drop hammers of the latest improved design and other high grade equipment, including a complete die shop with machine tools especially adapted to that important work. The machinery is now being set in position and will be in operation about October 1.

The Lowe Block Machine Company, Bristol, Tenn., manufacturer of cement block and brick machinery, has taken up an existing plant at Bristol and is now manufacturing cement block and brick machines, patented a few months ago by Luke T. Lowe. The capital stock of the company is $30,000 and the officers are M. D. Bochman, president; H. F. Henderson, vice-president, and Luke T. Lowe, general manager.

Included in orders recently taken by the Thomas Carlin Sons Company, River avenue, Allegheny, Pa., is one for a No. 1 shear, with 40-in. knives, for shipment to Toledo, Ohio, and another order for five large shears for Youngstown, Ohio.

Power Plant Equipment.

The Atlas works of the Standard Oil Company is building a one-story brick pump house for pumps and air compressors at its plant on Elk street, Buffalo, N. Y.

Bridges and Buildings.

A two-story brick office building, 32 x 35 ft., has recently been erected by the N. L. Yant Company, Rebecca street and Beaver avenue, Allegheny, Pa., fabricator of structural material. It will contain general offices, drafting department, &c.

Foundries.

The Hempfield Foundry Company has been organized at Greensburg, Pa., with a capital of $45,000, and proposes to erect a foundry at that place for the manufacture of general castings.

The Green Bay Machine & Foundry Company, Green Bay, Wis., has just installed a new milling machine, shaper and hydraulic press at its west side shops.

The Waterman Car Wheel & Foundry Company, Houston, Texas, has increased its capital stock from $75,000 to $100,000, the rapid growth of the business having made it necessary to double the output capacity.

Fires.

The plant of the C. F. Hatch Company, Lowell, Mass., manufacturer of paper boxes, was burned August 3, with loss of $30,000.

Fire visited the plant of the Eagle Foundry Company, Lowell, Mass., recently, and the foundry was totally destroyed, but the office and pattern sheds were saved. A good many patterns which were in use in the foundry were burned. The loss was about $8000, partly covered by insurance. The company has not yet decided what its future course will be.

Hardware.

The Hamblin & Russell Mfg. Company, Worcester, Mass., manufacturer of wire goods, is to build an addition to its main building, 25 x 40 ft. and five stories, which will bring the total space occupied for manufacturing up to 90,000 sq. ft. The company has recently completed a new power plant, 30 x 50 ft., in which a 200 hp. boiler and Corliss engine have been installed, together with an electric plant which will be used for lighting, power and electric welding.

The D. Wilcox Mfg. Company, Mechanicsburg, Pa., is making additions to and improvements in its plant which will entail an expenditure of about $50,000. A machine shop, one story, 45 x 175 ft., is being erected, also die and power house. Another addition will be 45 x 90 ft., in which eight drop hammers and other machinery will be installed by which the output of the works will be increased from 50 to 75 per cent. All specifications for material and machinery have been given out, and the enlarged works are expected to be in full operation by October 1.

The Rockwell Silver Company, Meriden, Conn., manufacturer of cut glass, sterling silver mounted, has been incorporated under Connecticut laws. E. F. Skinner, New Rochelle, N. Y., is president; Lucien Rockwell, treasurer, and Wells Rockwell, secretary.

The Higgin Mfg. Company, Newport, Ky., manufacturer of metal frame window screens and carriage trimmings, is building an addition to its plant, 87 x 67 ft., three stories and basement. This will add about 25 per cent. to the company's present floor space.

The McCaffrey File Company, Philadelphia, Pa., having been unable to meet the demand for its product as promptly as desired by the trade, has installed in its works a number of additional machines and general equipment, the greater part of which was built in its own machine shop. This will increase the product of the plant fully 20 per cent., making it possible for the concern to make much more satisfactory deliveries than for some time back.

Miscellaneous.

The Belt Ease Mfg. Company, Cleveland, has been incorporated, with a capitalization of $30,000. The incorporators are David Greenberger, S. Herkowitz and others.

The Fedders Mfg. Company, Buffalo, N. Y., manufacturer of automobile parts, radiators and sheet metal specialties, has completed and moved into its new factory at Tonawanda street and West avenue. It is a three-story brick structure, 38 x 160 ft.

The Dwight Mfg. Company, Chicopee, Mass., textile manufacturer, is largely increasing its works, including an addition to its machine shop. The new space will be used for a central supply room, for which no new machinery will be required.

The Beaton & Corbin Company, Southington, Conn., manufacturer of ceiling and floor plates, &c., is to build a two-story addition to its works, 20 ft. long. It will be used as a storeroom in stocking up for the fall trade.

The Austin Organ Company, Hartford, Conn., builder of electric and tubular pneumatic pipe organs, is erecting a two-story addition to its factory, 40 x 69 ft., one and two stories. No new machinery will be required at present.

The success with which the Wm. B. Scaife & Sons Company, Pittsburgh, has met in the installation of the Scaife and We-

Fu-Go water softening and purifying systems is best evidenced by the orders received from old customers for additional apparatus. Among them are the following: Carnegie Steel Company, 5 systems; American Sheet & Tin Plate Company, 18; New York State Steel Company, 2; Crucible Steel Company of America, 3; Atlas Portland Cement Company, 2; American Bridge Company, 2; Illinois Central Railroad Company, 10; Chicago & Eastern Illinois Railroad Company, 2; American Steel & Wire Company, 2; Chicago, Rock Island & Pacific Railway Company, 15.

The United States Envelope Company has awarded the contract for a new factory building which will constitute part of its Worcester, Mass., works. The building will be 140 x 223 ft., three and four stories, of brick, mill construction.

The Power Specialty Company, 111 Broadway, New York, has secured the exclusive sale of the Duval metallic packing in this country, Canada and Mexico. The company has ready for distribution a new catalogue descriptive of the Foster superheater and other steam specialties, including the packing mentioned.

The Hoggson & Pettis Mfg. Company, New Haven, Conn., manufacturer of the Sweetland chuck, reports that the recent fire in its plant will in no way interfere with the company's ability to make prompt deliveries, as its capacity was considerably increased a short time ago.

The Aird-Platt Mfg. Company has moved its plant for the manufacture of cast iron fittings from Watervliet, N. Y., to Guelph, Ont., and will discontinue manufacturing in this country. The Canadian concern will be known as the Standard Fitting & Valve Company, Ltd., and it is expected that manufacturing will be begun shortly.

The Brien Heater Company, manufacturer of house heating apparatus, which was organized 10 years ago with a plant at Hoosic Falls, N. Y., has been moved to Westfield, Mass., the majority of the stock being held by Westfield men.

The Vulcan Steam Forging Company has been incorporated at Buffalo, N. Y., to manufacture all kinds of steel forgings and shafting and to do general blacksmithing. It will make a specialty of chrome steel forgings for automobiles, connecting rods, armature shafts, &c. The company will build a plant on Rano street, making a connection with the Lackawanna Railroad. M. F. Duggan is president; Wm. J. Gamble, vice-president and general manager, and Edward Clark, secretary and treasurer.

The Colorado Fuel & Iron Company's Report.

The report of the Colorado Fuel & Iron Company for the year ended June 30 shows that the gross receipts for the 12 months were increased by $1,472,253 over those of the preceding year, while the increase in net was but $37,016. The income account for the year compares as follows:

	1907.	1906.
Gross	$23,792,298	$22,320,045
Operating and manufacturing expenses	21,196,254	19,761,017
Net	$2,596,044	$2,559,028
Other income	396,053	505,701
Total income	$2,992,097	$3,064,729
Charges, taxes, rentals, sinking fund, prospect, &c	2,522,005	2,392,917
Surplus	$470,092	$671,812

The earnings and expenses in detail for the last two years are as follows:

Earnings.

	1907.	1906.
Iron department	$13,927,108	$12,454,643
Industrial department	9,454,223	9,499,317
Denver retail department	410,967	366,085
Totals	$23,792,298	$22,320,046

Operating expenses.

Iron department*	$12,180,037	$10,883,679
Industrial department (full)	8,370,628	8,264,273
Denver retail department	383,205	342,230
Totals	$20,933,870	$19,490,182

* Includes excess cost of Lake Superior ore ($238,844).

President J. F. Welborn, in his statement to stockholders, says:

Owing to circumstances beyond the control of the management, improved results foreshadowed in the last annual report were not secured, and although the gross earnings from operations increased nearly $1,500,000, it was practically all absorbed by the higher prices of labor and materials and the increased cost of mining operations, due to the unavoidable casualties in two of the principal mines of the company. In addition to these, the transportation companies serving the mines and the manufacturing plants found it necessary, on account of increased prices paid by them for labor and materials, to advance their freight charges on our materials and supplies during the last half of the fiscal year. The combined effect of these unforseen conditions was, as stated, to absorb practically all the increase in gross earnings. But as the result of recently improved operating conditions and consequent increased output at the smaller mills in the Minnequa plant, the resumption of practically normal conditions at coal mines and moderate advances made in the selling price of products during the last few months, the monthly net earnings are now showing substantial gains over corresponding months of the previous year.

The increase in the output of pig iron already obtained and the completion of the additional open hearth furnaces early in the second quarter of the current year should insure a full supply of steel for the various finishing departments, notwithstanding the additions made to the latter during the past year.

The opening up of additional coal mines and the installation, now in progress, of improved equipment, where needed at old mines should result in a substantial increase in the output of both coal and coke.

Sales of all of the company's products continue to equal the output, with no signs of abatement, and the orders now booked will absorb the capacity of all departments for many months, the unfilled rail contracts being sufficient to keep the rail mill working continuously through the current year and well into the next.

The favorable conditions as to increased output and the demand therefor seem to justify the hope that the gross and net earnings of the current year will show substantial and satisfactory increases over the past year, and in the absence of unfavorable labor or market conditions, the belief expressed a year ago that an increase in both gross and net earnings might be expected with each succeeding year may well be repeated.

The additional iron ore blocked out during the past year at the New Mexico and Wyoming properties greatly exceeds the consumption during that period and insures a larger supply than has heretofore been known to exist, thus removing all cause for doubt or anxiety about the ore reserves of the company.

A continuous merchant mill, which was partially constructed several years ago and work stopped thereon after the expenditure of a large amount of money, is now nearing completion, and should almost double the output of merchant mill products.

The physical condition of all the properties has been maintained during the past year by proper expenditures for betterments and repairs, charged to operating accounts.

The council of the Iron and Steel Institute has issued a reprint of the first volume of the Transactions of the institute, published in 1869, which for a long time has been out of print. It contains interesting historical matter showing iron and steel development at the time the institute was founded. The committee having in charge the details of organization had Sir Lowthian Bell for its chairman. The statement was made in connection with the first meetings held for organization that the formation of the institute had become an urgent necessity "in face of the striking facts which at this time threaten the position of the British iron trade."

Improvements were completed in May on the iron ore briquetting plant of the Dunderland Iron Ore Company, Ltd. at Guldsmedvik i Ranen, Norway, and the capacity was increased to 1500 tons a week. It is expected to bring this up to 3000 tons a week ultimately. The plant was built in accordance with Thomas A. Edison's designs, but the fine grinding section did not work up to the expected efficiency and it was impossible to bring sufficient material to the proper fineness for treatment by the separating processes. Thus far about 27,000 tons of briquettes have been shipped to Great Britain, the principal user being the Consett Iron Company, Ltd.

The Iron and Metal Trades

Generally speaking the undertone throughout the Iron trade is one of increased nervousness over the future. The plants are all still running under high pressure, and will do so for the balance of this year, in order to fill orders now on the books. This is the season of the year when ordinarily there is a lull, but the contrast between recent experiences of record business and a quiet market may have an undue sentimental effect.

There is a falling off in new business in nearly all directions, but specifications against old contracts continue very heavy and there is no indication in the finished lines of any cessation of work under way.

Throughout the whole country the buying of Pig Iron is from hand to mouth and the market has not been really seriously tested, in Foundry Iron, for some time. But prices are weakening. There is some complaint that certain melters are exhausting every pretext for canceling high priced contracts and that Iron is being thrown on the market in this way.

It is admitted that the amount of Foundry Iron which is being melted has fallen off in quantity, but against that must be taken into account the fact that Foreign Iron, which was coming in at the rate of 30,000 to 40,000 tons a month, is no longer a factor in the supply.

One of the largest members of the Eastern Pig Iron Association, the Thomas Iron Company, has resigned. The work of the association, which does not embrace all the furnace companies, has consisted merely in the collection of statistics and in the interchange of information. It did not attempt to directly control prices or regulate output.

The Steel Corporation has purchased an additional lot of 5000 tons of Steel Billets from an eastern Pennsylvania open hearth plant. The Western market is quite bare of Steel. In the Chicago District two orders for an aggregate of 11,000 tons of Billets still remain unfilled. On the other hand, the Steel Corporation participated last week to the extent of 10,000 tons in a heavy selling movement of Sheet Bars, in the English market, for delivery during the last quarter, the German Steel works also taking a considerable tonnage.

The Steel Rail trade is very quiet. There is pending, however, some very large business for export, which may be closed at an early date.

Among the structural contracts placed during the week is a lot of 5000 tons for ore docks at Duluth. The bids for 11,000 tons of pier work in this city go in to-day, but there is some uncertainty as to the effect of the low prices at which city bonds are selling. The position of municipal bonds generally is telling on some branches of the Iron industry and upon the Cast Iron Pipe trade particularly, the larger sizes being affected more than others.

New business is coming in more slowly in the Sheet, Tin Plate, Iron Bar, and Tube trades, some large business for the latter being put over till next year. Steel Bars are not quite as active as before, but premiums are still being paid occasionally for prompt delivery.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Aug.21, 1907.	Aug.14, 1907.	July23, 1907.	Aug.22, 1906.
PIG IRON, Per Gross Ton :				
Foundry No. 2, Standard, Philadelphia	*$22.00*	$22.00	$22.50	$19.25
Foundry No. 2, Southern, Cincinnati	*22.75*	23.25	23.75	17.50
Foundry No. 2, Local, Chicago	*24.50*	24.50	25.00	19.50
Bessemer, Pittsburgh	*22.90*	22.90	23.40	19.10
Gray Forge, Pittsburgh	*21.90*	21.90	22.90	17.85
Lake Superior Charcoal, Chicago	**27.50**	27.50	27.00	19.50
BILLETS, &c., Per Gross Ton :				
Bessemer Billets, Pittsburgh	*29.00*	29.50	30.00	28.00
Forging Billets, Pittsburgh	*33.00*	33.00	34.00	33.00
Open Hearth Billets, Phila	*31.50*	31.75	32.00	29.00
Wire Rods, Pittsburgh	*36.00*	36.00	36.50	34.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross Ton :				
Steel Rails, Melting, Chicago	*17.00*	17.00	17.50	15.00
Steel Rails, Melting, Phila	*17.00*	17.50	17.75	17.00
Iron Rails, Chicago	*20.50*	20.75	21.50	22.00
Iron Rails, Philadelphia	*20.50*	20.50	25.00	21.50
Car Wheels, Chicago	**24.50**	24.50	24.00	18.50
Car Wheels, Philadelphia	*23.50*	23.50	25.00	17.00
Heavy Steel Scrap, Pittsburgh	*17.75*	17.75	18.00	16.50
Heavy Steel Scrap, Chicago	*14.75*	15.00	15.50	14.50
Heavy Steel Scrap, Philadelphia	*16.75*	17.00	17.50	17.00
FINISHED IRON AND STEEL, Per Pound :	Cents.	Cents.	Cents.	Cents.
Refined Iron Bars, Philadelphia	1.85	1.85	1.83½	1.73½
Common Iron Bars, Chicago	1.78	1.78	1.78	1.66½
Common Iron Bars, Pittsburgh	1.70	1.70	1.70	1.50
Steel Bars, Tidewater, New York	1.86	1.86	1.86	1.64½
Steel Bars, Pittsburgh	1.60	1.60	1.60	1.50
Tank Plates, Tidewater, New York	1.86	1.86	1.86	1.74½
Tank Plates, Pittsburgh	1.70	1.70	1.70	1.60
Beams, Tidewater, New York	1.86	1.86	1.86	1.84½
Beams, Pittsburgh	1.70	1.70	1.70	1.70
Angles, Tidewater, New York	1.86	1.86	1.86	1.84½
Angles, Pittsburgh	1.70	1.70	1.70	1.70
Skelp, Grooved Steel, Pittsburgh	*1.85*	1.85	1.90	1.57½
Skelp, Sheared Steel, Pittsburgh	**1.95**	1.95	1.90	1.60
SHEETS, NAILS AND WIRE, Per Pound :	Cents.	Cents.	Cents.	Cents.
Sheets, No. 27, Pittsburgh	2.50	2.50	2.50	2.40
Wire Nails, Pittsburgh	2.00	2.00	2.00	1.85
Cut Nails, Pittsburgh	**2.10**	2.10	2.05	1.75
Barb Wire, Galv., Pittsburgh	2.45	2.45	2.45	2.30
Lake Copper, New York	*19.00*	19.00	21.50	18.75
Electrolytic Copper, New York	*18.00*	18.00	21.00	18.50
Spelter, New York	*5.70*	5.75	6.00	6.05
Spelter, St. Louis	*5.55*	5.65	5.80	5.90
Lead, New York	*5.10*	5.15	5.25	5.75
Lead, St. Louis	5.00	5.00	5.00	5.67½
Tin, New York	*37.20*	36.20	41.15	41.37½
Antimony, Hallett's, New York	*9.00*	9.00	10.50	24.00
Nickel, New York	45.00	45.00	45.00	45.00
Tin Plate, 100 lb., New York	$4.09	$4.09	$4.09	$3.94

Chicago.

FISHER BUILDING, August 19, 1907.

In addition to a very satisfactory volume of business in Structural Shapes, arising from numerous small jobs, the placing of a contract for 5000 tons by the Duluth, Missabe & Northern Railroad for ore dock construction formed the principal item of interest in the week's transactions. This division of mill products is about the only one in which the receipt of new business is notably large and keeping pace with mill output. This result is seen in an extension of delivery dates, which, for local mills, are now 60 days distant. While the chief railroad interests are for the present not conspicuous in the Rail market a few small lots have been taken by the less important lines, and more or less inquiry continues to emanate from electric traction lines, but the difficulty of financing these projects remains in many cases an unsurmountable obstacle in the way of concluding purchases. The deterrent effect of high priced Pig Iron is nowhere more plainly seen than in the sluggish movement of Cast Iron Pipe, which is extremely quiet. Small lots imperatively demanded for maintenance work make up the tonnage being booked, and the aggregate of this business is by no means large. Approximately 5000 tons for the water works at Kansas City, to be let on September 3, is the only notable tonnage requirement in sight. Pig Iron and Scrap Material vie with each other in weakness and inactivity. Growing evidence of decreased consumption has developed inherent weakness in the former, though prices have nominally suffered no further decline. Neither is in demand, and Scrap, while seemingly stationary for the time being, is

clinging insecurely to its present level. Prompted by past experience in delinquent deliveries, consumers are anticipating their requirements further in advance than usual in furnishing specifications. Mills are, therefore, well supplied in this respect, though it is apparent in nearly all lines of Finished Material that new business, especially on forward delivery contracts, is considerably diminished.

Pig Iron.—The purchase of a few straggling lots, the aggregate tonnage of which was inconsequential, represented the extent of movement for the week in Pig Iron. As the weeks continue to pass with no intimation from foundries of urgent needs, either for the present or the final quarter of the year, the conviction is being forced that the volume of melt has been much reduced. Doubtless, too, the prevailing cheapness of Cast Scrap as compared with the high prices that have ruled in Pig Iron has led to larger substitutions of this material and the consequent extension of stocks. Whatever the cause, it is a fact that consumers are manifesting no interest in the market; and this is emphasized by the absence of inquiries, even of a tentative nature, for all deliveries. One important consuming interest last week offered to take 2000 tons at a price basis of $17.50, Birmingham, for No. 2 Foundry, but the tender failed of acceptance. Nominally prices are unchanged, for the reason that no demand has appeared to furnish a basis for negotiations. For No. 2 Foundry $20, Birmingham, is still asked for fourth quarter, while Northern Iron for the same delivery is held at about $24.50, Chicago. But as previously noted, these prices would doubtless be subject to revision for desirable tonnage. Although $18 to $18.50, Birmingham, represent the general range of quotations for first quarter, these prices cannot be regarded as definitely established. The whole situation is one of waiting on both sides, and the ultimate solution of the problem awaits the resumption of an active demand. The following prices are for August and September delivery, f.o.b. Chicago:

Lake Superior Charcoal	$27.50 to $28.00
Northern Coke Foundry, No. 1	25.00 to 25.50
Northern Coke Foundry, No. 2	24.50 to 25.00
Northern Coke Foundry, No. 3	23.50 to 24.00
Northern Scotch, No. 1	25.50 to 26.00
Ohio Strong Softeners, No. 1	25.50 to 26.00
Ohio Strong Softeners, No. 2	25.00 to 25.50
Southern Coke, No. 1	24.85 to 25.35
Southern Coke, No. 2	24.35 to 24.85
Southern Coke, No. 3	23.85 to 24.35
Southern Coke, No. 4	23.35 to 23.85
Southern Coke, No. 1 Soft	25.35 to 25.85
Southern Coke, No. 2 Soft	24.85 to 25.35
Southern Gray Forge	21.35 to 21.85
Southern Mottled	21.35 to 21.85
Malleable Bessemer	24.90 to 25.40
Standard Bessemer	25.40 to 25.90
Jackson Co. and Kentucky Silvery, 6 %	31.40 to 31.90
Jackson Co. and Kentucky Silvery, 8 %	32.40 to 32.90
Jackson Co. and Kentucky Silvery, 10 %	33.40 to 33.90

Billets and Rods.—Two inquiries for Rolling Billets, aggregating 11,000 tons, have appeared in the market, but so far as known neither has resulted in the placing of an order. Some inquiry and a few orders for Forging Billets in small lots are noted. Local producers are able to supply but little outside tonnage, and are not actively seeking business of this character. Bessemer and Open Hearth Forging Billets are quoted at $36 to $38. Wire Rods are in fair demand, but transactions are limited by the scarcity of supply from leading sources. Quotations remain at $36 to $38, Pittsburgh.

Rails and Track Supplies.—A number of inquiries for Standard Section Rails, emanating from small steam roads and traction lines, have come in during the week, and a few sales of this sort involving small tonnage have been made. No indications are apparent, however, of immediate activity in Rail purchases by the large railroad systems, nor, indeed, is there any good reason to expect a resumption of buying until the question of specifications has been threshed out by the joint railroad and mill interests. A reasonably good demand for Track Supplies is reported, and orders for Light Rails are also fairly plentiful. We quote as follows: Angle Bars, accompanying Rail orders, 1907 delivery, 1.65c.; car lots, 1.75c. to 1.85c.; Spikes, 2.20c. to 2.30c., according to delivery; Track Bolts, 2.65c. to 2.75c., base, Square Nuts, and 2.80c. to 2.90c., base, Hexagon Nuts. The store prices on Track Supplies range from 0.15c. to 0.20c. above mill prices. Light Rails, 30 to 45 lb. sections, $34; 25-lb., $35; 20-lb., $36; 16-lb., $37; 12-lb., $38, f.o.b. mill. Standard Sections, $28, f.o.b. mill, full freight to destination.

Structural Material.—The only considerable contract for Structural Material placed during the week was one of 5000 tons, to be used in the construction of ore docks for the Duluth, Missabe & Northern Railroad, which was taken by the American Bridge Company. The amount of tonnage coming in on small jobs helps materially to swell the general volume of business, which continues to be of good proportions. Because of the wide latitude allowed in specifications for the Government bridge to span the Mississippi at Fort Snelling, Minn., figures on which were submitted by fabricators some weeks ago, a wide variation in bids resulted. This has occasioned delay in letting of the contract, but it is now expected that it will be placed within a week or two. Mill specifications are heavy and deliveries are not now promised inside of 60 days. Prices from store are quoted without change, at 2.05c. to 2.10c., and mill prices at Chicago are as follows: Beams and Channels, 3 to 15 in., inclusive, 1.88c.; Angles, 3 to 6 in., ¼-in. and heavier, 1.88c.; larger than 6 in. on one or both legs, 1.98c.; Beams, larger than 15 in., 1.98c.; Zees, 3 in. and over, 1.88c; Tees, 3 in. and over, 1.93c., in addition to the usual extras.

Plates.—It is noted that while specifications on existing contracts are not lacking, there are comparatively few inquiries or orders in the market for new tonnage of notable size. Business already booked by the principal producers will be sufficient to keep mill capacities pretty well engaged for the remaining months of the year. We quote for future delivery as follows: Tank Plates, ¼-in. and heavier, wider than 6¼ and up to 100 in. wide, inclusive, car lots, Chicago, 1.88c. to 2.08c.; 3-16 in., 1.98c. to 2.18c.; Nos. 7 and 8 gauge, 2.03c. to 2.23c.; No. 9, 2.13c. to 2.33c.; Flange quality, in widths up to 100 in., 1.98c. to 2.08c., base, for ¼-in. and heavier, with the same advance for lighter weights; Sketch Plates, Tank quality, 1.98c. to 2.18c.; Flange quality, 2.08c. Store prices on Plates are as follows: Tank Plates, ¼-in. and heavier, up to 72 in. wide, 2.20c. to 2.30c.; from 72 to 96 in. wide, 2.30c. to 2.40c.; 3-16 in. up to 60 in. wide, 2.30c. to 2.40c.; 72 in. wide, 2.50c. to 2.65c.; No. 8, up to 60 in. wide, 2.35c. to 2.45c.; Flange and Head quality, 0.25c. extra.

Sheets.—After a short period of increased activity, the demand has settled back in line with other mill products. A fair amount of new business is offered, but with the heavy shipments being made, some progress in the relief of mill congestion is realized, though, at best, normal conditions of delivery cannot be restored for some time to come. We quote mill shipments as follows, Chicago: Blue Annealed, No. 10, 2.03c.; No. 12, 2.08c.; No. 14, 2.13c.; No. 16, 2.23c.; Box Annealed, Nos. 17 to 21, 2.53c.; Nos. 22 to 24, 2.58c.; Nos. 25 to 26, 2.63c.; No. 27, 2.68c.; No. 28, 2.78c.; No. 29, 2.88c.; No. 30, 2.98c.; Galvanized Sheets, Nos. 10 to 14, 2.83c.; Nos. 15 and 16, 3.03c.; Nos. 17 to 21, 3.18c.; Nos. 22 to 24, 3.33c.; Nos. 25 and 26, 3.53c.; No. 27, 3.73c.; No. 28, 3.93c.; No. 30, 4.43c. Sheets from store: Blue Annealed, No. 10, 2.40c.; No. 12, 2.45c.; No. 14, 2.50c.; No. 16, 2.60c.; Box Annealed, Nos. 18 to 21, 2.70c.; Nos. 22 to 24, 2.75c.; No. 26, 2.80c.; No. 27, 2.85c.; No. 28, 2.95c.; No. 30, 3.35c.; Galvanized, from store: Nos. 10 to 20, 3.20c. to 3.30c.; Nos. 22 to 24, 3.55c. to 3.60c.; No. 26, 3.65c. to 3.70c.; No. 27, 3.85c. to 3.95c.; No. 28, 4.15c.; No. 30, 4.65c. to 4.70c.

Bars.—Following the heavy buying for forward delivery that marked the covering of season requirements by the implement and other manufacturing interests some weeks ago, new business has not been especially large in volume. Specifications, however, are plentiful, and are being offered further ahead of requirements than is ordinarily the case. Easier Scrap Iron prices have had a stimulating effect on Bar Iron, and the demand is reported to be somewhat better than in previous weeks. Rumors of soft spots, resulting in slight shadings are heard, but in this market fairly firm conditions prevail. Quotations, Chicago, are as follows: Steel Bars, 1.78c., with half extras; Iron Bars, 1.78c.; Hoops, 2.18c., extras as per Hoop card; Bands, 1.78c., as per Bar card, half extras; Soft Steel Angles and Shapes, 1.88c., half extras. Store prices are as follows: Bar Iron, 2.10c. to 2.25c.; Steel Bars, 2c. to 2.10c.; Steel Bands, 2c., as per Bar card, half extras; Soft Steel Hoops, 2.35c. to 2.45c., full extras.

Merchant Pipe.—With the mills still months delinquent on deliveries it is difficult to estimate the present state of demand. It is likely that, in common with most other lines of Finished Material, buying for future requirements is on a somewhat diminished scale. Whatever diminution of new business there may be is not, however, apparent in improved deliveries of Tubular goods. The following mill discounts are quoted: Black Pipe, ¾ to 6 in., 71.2; 7 to 12 in., 68.2; Galvanized, ¾ to 6 in., 61.2. These discounts are subject to 1 point on the base. From store in small lots, Chicago jobbers quote 68 per cent. on Black Steel Pipe, ¾ to 6 in. About 4 points advance above these prices is asked for Iron Pipe.

Boiler Tubes.—Requirements of the boiler shops, though not up to the high standard of previous months, are still fair. Owing to the difficulty in securing prompt shipment of supplies from mill, jobbers' stocks continue to be the chief source of supply for immediate wants. Mill quotations for future delivery on the base sizes are as follows: 2¾ to 3 in., in carload lots, Steel Tubes, 63.2; Iron, 50.2; Seamless, 49.2; 2½ in. and smaller, and lengths over 18 ft., and 2½ in. and larger and lengths over 22 ft., 10 per cent. extra. Store prices are as follows:

	Steel.	Iron.	Seamless.
1 to 1½ in.	35	35	35
1¾ to 2¼ in.	50	35	35
2½ in.	52½	35	35
2¾ to 3 in.	60	47½	47½
6 in. and larger	50	35	..

Merchant Steel.—A fair average trade in miscellaneous

shapes under this head is reported. One important mill interest states that its July tonnage of such material was the largest in its history for that month. Quotations are as follows: Planished or Smooth Finished Tire Steel, 1.98c.; Iron Finish, up to 1½ x ½ in., 1.93c.; Iron Finish, 1½ x ½ in. and larger, 1.78c., base; Channels for solid Rubber Tires, ¾ to 1 in., 2.28c., and 1⅛ in. and larger, 2.18c.; Smooth Finished Machinery Steel, 2.18c.; Flat Sleigh Shoe, 1.93c.; Concave and Convex Sleigh Shoe, 2.08c.; Cutter Shoe, 2.46½c.; Toe Calk Steel, 2.33c.; Railroad Spring, 1.98c.; Crucible Tool Steel, 7¼c. to 8c., and still higher prices are asked on special grades. Shafting, 50 and 10 per cent. off in car lots, and 50 and 5 per cent. in less than car lots, base territory.

Cast Iron Pipe.—Small orders ranging from car lots to 200 tons constitute the bulk of the business being done by pipe founders. The only letting of notable importance in sight is one scheduled for September 3, which will include the year's requirements of the Kansas City, Mo., waterworks system, approximately 5000 tons. We quote, per net ton, Chicago, as follows: Water Pipe, 4-in., $38 to $39; 6 to 12 in., $37 to $38; 16-in. and up, $36 to $37, with $1 extra for Gas Pipe.

Coke.—A somewhat strengthened demand is noted for both prompt delivery and contract requirements. A tendency toward greater firmness in prices is observed. Connellsville 72-hr. Foundry Coke is quoted at $3.15 to $3.25, at oven.

Old Material.—Transactions are exceedingly light. There is, in fact, so little movement that the market is without an adequate basis of sales upon which to found anything more than an approximate range of prices. Car Wheels continue to be one of the strongest items of the list. Though nothing more than a few small lots have been offered, $25 was realized on a car lot. Mill material has suffered a further decline, but Steel Melting Stock has not changed appreciably since last report. Signs of improvement are lacking; on the contrary, all indications point to still further recessions, since there is not demand enough to support the market. We quote as follows per gross ton, f.o.b. Chicago:

Old Iron Rails	$20.50 to $21.00
Old Steel Rails, rerolling	16.75 to 17.25
Old Steel Rails, less than 3 ft	17.00 to 18.00
Relaying Rails, standard sections, subject to inspection	28.00 to 30.00
Old Car Wheels	24.50 to 25.00
Heavy Melting Steel Scrap	14.75 to 15.25
Frogs, Switches and Guards, cut apart	15.50 to 16.00
Mixed Steel	11.00 to 11.50

The following quotations are per net ton:

Iron Fish Plates	$16.25 to $16.50
Iron Car Axles	23.00 to 23.50
Steel Car Axles	20.00 to 20.50
No. 1 Railroad Wrought	14.25 to 14.75
No. 2 Railroad Wrought	13.50 to 14.00
Railway Springs	14.50 to 15.00
Locomotive Tires, smooth	17.50 to 18.00
No. 1 Dealers' Forge	12.00 to 12.50
Mixed Busheling	10.50 to 11.00
Iron Axle Turnings	10.50 to 11.00
Soft Steel Axle Turnings	10.50 to 11.00
Machine Shop Turnings	10.50 to 11.00
Cast Borings	9.00 to 9.50
Mixed Borings, &c	9.00 to 9.50
No. 1 Mill	9.75 to 10.25
No. 2 Mill	8.75 to 9.25
No. 1 Boilers, cut to Sheets and Rings	10.50 to 11.00
No. 1 Cast Scrap	16.50 to 17.00
Stove Plate and Light Cast Scrap	14.00 to 14.50
Railroad Malleable	16.00 to 16.50
Agricultural Malleable	14.75 to 15.25
Pipe and Flues	11.25 to 11.75

Metals.—Dullness rules in practically all Metals. Quantity buyers of Copper decline to make commitments for future requirements without a guarantee from the chief selling interests that the established price will be maintained for a reasonable term. Meanwhile buying for immediate wants is the rule. We quote as follows: Casting Copper, 21½c. to 22s.; Lake, 22¼c. to 22¾c., in car lots for prompt shipment; small lots, ¼c. to ⅜c. higher; Pig Tin, car lots, 41½c.; small lots, 42¼c.; Lead, Desilverized, 5.75c. to 5.85c., for 50-ton lots; Corroding, 6.40c. to 6.50c., for 50-ton lots; in car lots, 2¼c. per 100 lb. higher; Spelter, 6.10c.; Cookson's Antimony, 16c., and other grades, 15c. to 15½c.; Sheet Zinc is $8.10 list, f.o.b. La Salle, in car lots of 600-lb. casks. On Old Metals we quote: Copper Wire, 19c.; Heavy Copper, 18c.; Copper Bottoms, 16½c.; Copper Clips, 17½c.; Red Brass, 16½c.; Red Brass Borings, 14c.; Yellow Brass, 14c.; Yellow Brass Borings, 12c.; Light Brass, 10c.; Lead Pipe, 4½c.; Tea Lead, 4.15c.; Zinc, 4½c.; Pewter, No. 1, 29½c.; Tin Foil, 34c.; Block Tin Pipe, 37c.

The puddling mill of the Kittanning Iron & Steel Mfg. Company, Kittanning, Pa., has been crippled in operation for some time by the strike of puddlers belonging to the recently organized Sons of Vulcan. The company signed the Amalgamated Association puddling scale, but refused to sign the scale of the Sons of Vulcan. The men belonging to the latter organization have at length decided that they will return to work without their scale being signed.

Philadelphia.

PHILADELPHIA, PA., August 20, 1907.

Conditions in the Iron trade are not materially different from what they have been for the past several weeks. There is certainly no improvement, while the undertone is more nervous than it has yet been. Buyers of Pig Iron take no interest in the market, and no sales are being made except small lots for early delivery, which can be had on terms which suggest materially lower prices when large buyers begin to make bids. Deliveries on old contracts are considerable and appear to meet all requirements, so that very little new Iron is required to carry them through. It is said that a good deal of buying will have to be done for the fourth quarter, but the furnaces are evidently in a position to meet all demands, so that consumers are not worrying themselves, as they did during the past 12 or 18 months, as there is every reason to believe that there will be enough Iron to meet all possible requirements. With more room for consumers to pick and choose from, prices are expected to be lower, but how much lower it is at present impossible to say. The general outlook, however, appears to warrant the attitude which buyers have assumed. Every day weakens the position of holders and will continue to do so until a demand can be established and prices placed on a more or less definite basis. This demand may not arise on the assumption that prices are low enough, but because Pig Iron is needed. When that point is reached it will not be because of any man's opinion, but Iron must be had, and if it costs a little more, or the sellers have to accept a little less, it is of comparatively little importance; it establishes a price, which for the time being must be regarded as genuine. This has been more or less a matter of guess work during the past eight or ten weeks, but the time is not far off when a start will be made on the lines suggested.

Pig Iron.—Sales of Pig Iron during the past week have probably been as small as any week since the first of the year. Large consumers appear to have abandoned the market, and show no sign that they have any interest in it beyond taking in the Iron that is due to them and waiting until they actually need more Iron or have prices quoted to them which may be regarded as worth their considering. To those who have followed the insatiable demand of the last two or three years it is marvelous to see the revulsion of feeling which now prevails. The mails and telephones were burdened with requests for additional tonnages of Iron and for immediate shipments of what was already due them. It is true that the Steel mills are still urging for prompt shipments, but there are no signs that they want to renew contracts while the market is in its present unsettled condition. This has continued so long, however, that there must certainly be some new trading in the near future, as both producers and consumers will feel that they need to renew contracts, and as they are both in the same position, it will not be difficult for them to get together. A man that wants to sell Iron to one that wants to buy has a comparatively easy task and it is not difficult to arrive at a satisfactory basis of prices; but as the old saying is, "It takes two to make a bargain," and although there are no inquiries that indicate an early renewal of the demand, such a contingency is becoming closer week by week. It would be treading on dangerous ground to attempt a forecast in regard to what prices will be agreed upon, but in view of the fact that small lots of No. 2 X Foundry can be readily had at $22 to $22.50, delivered, it is almost certain that concessions of $1 per ton would be granted for last quarter Iron, and perhaps more than that for first quarter of 1908. Basic Iron is weak, with little or no demand. September shipments could be had at less than $21, delivered, and fourth quarter at pretty close to $20, if bids of the right kind could be had. Consumers have been paying too much for raw material, and now that their turn has come they propose to even things up a little. Low Phosphorus Iron has been sold at equivalent to $27.50, Philadelphia, for standard, but most of the sales (1500 to 2000 tons) were off grades, at prices in proportion. For the present sales are in small lots at about the following prices for deliveries in buyers' yards in eastern Pennsylvania and adjoining territory:

No. 2 X Foundry	$22.00 to $22.50
Gray Forge	19.00 to 20.50
Basic	20.50 to 21.00
Low Phosphorus	27.50 to 28.00

Ferroalloys.—A few small sales of Ferromanganese have been made for Western account, mostly at about $62, Pittsburgh, for last quarter shipment. Prices are nominal. Some business has been done at about $60 to $61, seaboard, for prompt shipments, although $1 or $2 less could be done for deliveries over the last quarter.

Steel.—Business is extremely dull, and only a few small lots have been taken in the past few days. Specifications on old contracts are fairly satisfactory, however, so that the mills are running moderately full, at prices ranging from $31.50 to $32.50 for nearby deliveries of ordinary Rolling Steel; $35 to $36 for Forging Steel.

Plates.—In line with the rest of the market, there is

very little new demand, and mills are dependent largely on their back orders. Specifications for these come in with a fair degree of promptness, and as yet it cannot be said that there is any real shortage of employment. Prices are unchanged (as quoted for several months past), as follows:

	Carload. Cents.	Part carload. Cents.
Tank, Bridge and Boat Steel	1.85	1.90
Flange or Boiler Steel	1.95	2.05
Marine	2.20	2.25
Locomotive Firebox Steel	2.40	2.45

The above are base prices for ¼-in. and heavier. The following extras apply:

	Extra per 100 lb.
3-16-in. thick	$0.10
Nos. 7 and 8, B. W. G.	.15
No. 9, B. W. G.	.25
Plates over 100 to 110 in.	.05
Plates over 110 to 115 in.	.10
Plates over 115 to 120 in.	.15
Plates over 120 to 125 in.	.25
Plates over 125 to 130 in.	.50
Plates over 130 in.	1.00

Structural Material.—The demand is very light at the present time, and mills are in a position to make good deliveries on almost anything that buyers may require within the next 30 to 60 days. Nothing is doing in large lots, and prices remain unchanged at 1.85c. to 2c., according to specification.

Bars.—Business is extremely disappointing, there being few inquiries, so that the order books at the mills are beginning to look thin. Specifications come in rather slowly, and it requires a good deal of scheming to keep the mills running at anyhing near their capacity. Prices are still quoted at 1.85c. for best Refined Iron, and about the same for Steel, although on the latter a tenth less can be done for deliveries during the fourth quarter.

Sheets.—The Sheet trade keeps up quite as well as any of the collateral branches, but there is nothing like activity. Prices are steady, however, and sales are mostly made at about the following figures for mill shipments and a tenth higher for small lots: Nos. 18 to 20, 2.80c.; Nos. 22 to 24, 2.90c.; Nos. 25 to 26, 3c.; No. 27, 3.10c., and No. 28, 3.20c.

Old Material.—The market is no better than it was a week ago, and it is difficult to quote prices based on actual transactions. Choice No. 1 Steel has been sold by railroads at $17 delivered to consumers, but it is hard to say what could be done on outside lots. The depression is very general, and it is hard to get bids unless for something that is wanted immediately. Bids and offers for deliveries in buyers' yards are about as follows, with sales of good sized lots of Steel at the inside figure:

No. 1 Steel Scrap	$16.75 to $17.25
Low Phosphorus	22.00 to 23.00
Old Steel Axles	20.00 to 20.50
Old Iron Axles	28.00 to 29.00
Old Iron Rails	20.50 to 21.00
Old Car Wheels	23.00 to 23.50
Choice No. 1 R. R. Wrought	18.00 to 18.50
Machinery Castings	18.00 to 18.50
Wrought Iron Pipe	14.50 to 15.00
No. 1 Forge Fire Scrap	14.75 to 15.00
Wrought Turnings	14.00 to 14.50
Stove Plate	14.50 to 15.00
Cast Borings	13.00 to 13.50
Grate Bars	14.50 to 15.00
No. 2 Light Sheet Steel	13.00 to 14.00

F. C. Maurer & Co. have opened offices at 1718 Land Title Building, Philadelphia, Pa., for the sale of Iron and Steel products. They are sales agents for Spang, Chalfant & Co., Incorporated, Pittsburgh, with which company Mr. Maurer was formerly connected as traveling salesman.

Birmingham.

BIRMINGHAM, ALA., August 18, 1907.

Pig Iron.—No transactions are reported this week, except a few very small lots for immediate shipment. Inquiries have fallen off to a great extent, but this is partly due to the fact that we have been practically cut off from the balance of the country, so far as telegraphic communication is concerned. Buying for future delivery has subsided entirely, and while quotations remain the same, no doubt attractive prices could be secured if there was any business to be placed. There is a wide variation in views of the different makers as to the prices which should apply to the balance of third and business for fourth quarter shipment. Those furnaces which have their production for the balance of the year under contract are maintaining prices heretofore prevailing, but some of the furnaces which did not succeed in placing their entire make for the year are selling what surplus they have at a considerable concession. There is a very small amount of re-sale Iron on the market, which is being offered at slightly lower than the ruling prices, but this is not of sufficient quantity to disturb conditions. While the trade journals are talking of the let up in all lines of foundry work and less Iron being melted, the producers here still maintain that they are having no requests to withhold shipments, but on the other hand state that buyers are as insistent upon deliveries as ever. Especially is this true of the higher grades of Foundry Iron, some of the furnaces being more than 60 days behind on deliveries. This, however, as stated heretofore, is due to the fact that little Soft Iron is now being produced, on account of the extremely warm weather and the irregular burden which all furnaces are forced to use.

Cast Iron Pipe.—Foundries here are working on old orders, and are several months behind on deliveries. New business is very scarce and is confined entirely to small orders. There is a tendency on the part of the larger consumers to defer buying until more favorable prices can be secured, and they figure that, inasmuch as the Pig Iron market is somewhat weaker, lower prices may be ruling at no distant date. Quotations are slightly irregular, but the following prices per net ton are now quoted by leading interests: Water Pipe, 4 in. to 6 in., $35; 8 in. to 12 in., $33; over 12 in., average $31, with Gas Pipe $1 extra per ton.

Old Material.—The outlook in the Scrap market is not very encouraging. Little business is being transacted, as users are buying only for actual requirements. Dealers are carrying small stocks and are taking very few risks. Quotations are approximately as follows, per gross ton, f.o.b. cars here:

Old Iron Rails	$22.00 to $22.50
Old Iron Axles	18.50 to 19.00
Old Steel Axles	17.00 to 17.50
Old Car Wheels	20.50 to 21.00
No. 1 Railroad Wrought	18.00 to 18.50
No. 2 Railroad Wrought	13.00 to 13.50
No. 1 Country Wrought	13.50 to 14.00
No. 2 Country Wrought	12.00 to 12.50
Wrought Pipe and Flues	13.00 to 13.50
Railroad Malleable	14.00 to 14.50
No. 1 Steel	14.50 to 15.00
No. 1 Machinery Cast	16.00 to 16.50
Stove Plate and Light Cast	12.50 to 13.00
Cast Borings	8.50 to 9.00

Pittsburgh.

PARK BUILDING, August 20, 1907.

Pig Iron.—There seems to be a little more inquiry for Pig Iron, but mostly for small lots and prompt shipment. Consumers of Bessemer Iron are pressing the furnaces for prompt deliveries. There is practically no Bessemer to be had for August delivery and very little for September. One local interest has bought about 500 tons of Bessemer for September shipment at $22, Valley furnace, or $22.90, Pittsburgh, and we quote the market at that price. There is a wide range in the prices quoted on Northern No. 2 Foundry Iron for prompt delivery. In several cases some furnaces have quoted as low as $22, while others are asking $23, and are selling small lots of Iron at that price. We note a sale of No. 2 Foundry for prompt shipment at $23, at furnace; also a sale of 150 tons for last quarter delivery at $22.50 at furnace. We quote No. 2 Foundry for prompt delivery at $22.50 to $23, and for last quarter at $22 to $22.50, Valley furnace. There is practically no inquiry for Foundry Iron for next year's delivery. A local interest has bought 1000 to 1500 tons of Northern Forge Iron at a relatively low price. We quote the market on Northern Forge at nominally $21 at furnace, but on a firm offer this price would be shaded.

Steel.—The Carnegie Steel Company has bought 3000 tons of 4 x 4 in. Open Hearth Billets from the Alan Wood Iron & Steel Company, for delivery to the American Bridge Company, at Pencoyd, Pa. Prices on Steel seem to be a little easier, and we quote Bessemer Billets at $29 to $29.50, and Open Hearth at $31, Pittsburgh. Forging Billets are quoted at about $33, Pittsburgh, and Sheet Bars are firm, at $31, at Pittsburgh or Youngstown mill.

(By Mail.)

General conditions in the Iron trade continue extremely quiet. Sentiment is more pessimistic than for some time, and the large Steel concerns admit that there has been a large falling off in new business. This is the season of the year when a lull always occurs in the Iron trade, but previous conditions have been so active that the present slackening down is more noticeable. In Pig Iron only small lots are being sold, but a strong feature in Bessemer Pig Iron is that consumers are urging deliveries, and are taking in Iron as fast as the furnaces can ship it. This is not the case, however, with Foundry Iron, as quite a number of the foundries holding up shipments and consumers are buying only for urgent needs. In Finished Iron and Steel, the mills have a heavy tonnage on their books, and are pretty comfortably filled with work for the balance of the year. This applies on practically all lines with the exception of Tin Plate, which is unusually dull. The Coke trade is better in demand and price, but Scrap is neglected, and weak. It is believed that there will be more buying in September, particularly in Tin Plate, as the large canning interests are then expected to come in the market for their requirements for the remainder of the year.

Ferromanganese.—There is a moderate inquiry for last quarter delivery, and a sale of 150 tons of English 80 per cent. for October, November and December is reported, on the basis of about $60, Pittsburgh. We quote, for prompt

delivery, $62.50 to $63, and for balance of the year, $60 to $61, Pittsburgh.

Muck Bar.—There is not much inquiry, but the supply is limited, and prices are firm. We quote best grades of Bar made from all Pig Iron at $37, Pittsburgh.

Skelp.—Not much new business is being placed, but the mills are filled up for two or three months on contracts on which buyers are specifying freely. Prices are firm, and we quote: Grooved Steel Skelp, 1.85c. to 1.90c.; Sheared Steel Skelp, 1.95c. to 2c.; Grooved Iron Skelp, 2.15c. to 2.20c., and Sheared Iron Skelp, 2.25c. to 2.40c., depending on sizes and widths. All these prices are f.o.b. maker's mill.

Wire Rods.—While the demand for Rods is not very active, the supply is limited and prices continue firm. We quote Bessemer Rods at $36 to $36.50 and Open Hearth Rods at $37, Pittsburgh.

Steel Rails.—No large contracts are being placed by the railroads, and it is not likely that any will be given out until the Rail mills and the railroads get together on the specification question. There is a Specification Committee appointed by the railroads, of which George L. Peck, general manager of the Pennsylvania Lines West, is chairman, and A. C. Shand, chief engineer of the Pennsylvania Railroad, is also a member. Messrs. Peck and Shand have been abroad for some little time, presumably for the purpose of studying the railroad question on the other side, and as they are now home something from the railroad side of the question will likely be forthcoming in a short time. Orders entered by the Carnegie Steel Company in the past week amounted to only about 2500 tons of Standard Sections and about 2000 tons of Light Rails. The demand for the latter has been quite active for some time. We quote Light Rails as follows: $33 to $34 for 20 to 45 lb.; $34 to $35 for 16-lb., and $35 to $36 for 12-lb., at mill. Angle Splice Bars are held at 1.65c., and Standard Section Rails at $28, at mill.

Plates.—Only a moderate amount of new tonnage is being placed in Plates, but as the leading mills are well sold up for three to four months, this falling off in new business will give them a chance to catch up on deliveries. The Steel car builders are pretty well filled with contracts for some time and will probably take out their full requirements for the balance of this year at least. Prices are firm, and it is stated that occasionally slight premiums are still being paid for Plates for quick shipment. We quote Tank Plates, ¼-in. thick, 6¼ in. up to 100 in. wide, 1.70c. to 1.80c., base, at mills, Pittsburgh. Extras over this price are as follows:

	Extra per 100 lb.
Gauges lighter than ¼-in. to and including 3-16-in. Plates on thin edges	$0.10
Gauges Nos. 7 and 8	.15
Gauge No. 9	.25
Plates over 100 to 110 in	.05
Plates over 110 to 115 in	.10
Plates over 115 to 120 in	.15
Plates over 120 to 125 in	.25
Plates over 125 to 130 in	.50
Plates over 130 in	1.00
All sketches (excepting straight taper Plates varying not more than 4 in. in width at ends, narrowest end being not less than 30 in.)	.10
Complete Circles	.20
Boiler and Flange Steel Plates	.10
"A. B. M. A." and ordinary Firebox Steel Plates	.20
Still Bottom Steel	.30
Marine Steel	.40
Shell Grade of Steel is abandoned.	

TERMS.—Net cash 30 days. For anticipated payments a maximum discount may be allowed at the rate of 6 per cent. per annum and for a longer time than 30 days interest shall be charged at the same rate per annum. Invoices paid within 10 days from date thereof, discount of ½ of 1 per cent. is allowable. Pacific Coast base, 1.60c., f.o.b. Pittsburgh, with all rail tariff rate of freight to destination added, no reduction for rectangular shapes 14 in. wide down to 6 in. of Tank, Ship or Bridge quality.

Structural Material.—Inquiry for new work is somewhat quiet, but in the past week some large contracts have been placed. The McClintic-Marshall Construction Company has been awarded a New York City contract for the building of Steel piers, 57, 58 and 59, North River, requiring about 13,000 tons of Steel. Two more piers, involving about 10,000 tons, are to be placed Wednesday. The same concern has taken a viaduct for the Chicago, Milwaukee & St. Paul, about 1700 tons. The Pennsylvania Railroad will probably build a Steel bridge 600 ft. long at the Point in this city, which will require a large tonnage. Deliveries by the mills are better than for some time, but are not yet quite as prompt as fabricators would like to have them. We quote: Beams and Channels, up to 15 in., 1.70c.; over 15 in., 1.80c.; Angles, 3 x 2 x ¼ in. thick, up to 6 x 6 in., 1.70c.; 8 x 8 and 7 x 3½ in., 1.80c.; Zees, 3 in. and larger, 1.70c.; Tees, 3 in. and larger, 1.75c. Under the Steel Bar card, Angles, Channels and Tees under 3 in. are 1.70c., base, for Bessemer and Open Hearth, subject to half extras on the Standard Steel Bar card.

Sheets.—New business in Sheets is much lighter than it was some time ago, but the mills still have a large amount of work on their books. The demand for Roofing Sheets is particularly quiet, but it is stated that few mills are making slight concessions in prices. On Galvanized Sheets the mills are still very much behind, but they are gradually catching up on deliveries on Black and Blue Annealed Sheets. Prices are firm and we quote: Blue Annealed Sheets, No. 10 gauge and heavier, 1.85c.; Nos. 11 and 12, 1.90c.; Nos. 13 and 14, 1.95c.; Nos. 15 and 16, 2.05c.; Box Annealed, Nos. 17 to 21, 2.35c.; Nos. 22 to 24, 2.40c.; Nos. 25 and 26, 2.45c.; No. 27, 2.50c.; No. 28, 2.60c.; No. 29, 2.75c.; No. 30, 2.85c. We quote Galvanized Sheets as follows: Nos. 10 and 11, 2.65c.; Nos. 12 and 14, 2.75c.; Nos. 15 and 16, 2.85c.; Nos. 17 to 21, 3c.; Nos. 22 and 24, 3.15c.; Nos. 25 and 26, 3.35c.; No. 27, 3.55c.; No. 28, 3.75c.; No. 29, 4c., and No. 30, 4.25c. We quote No. 28 gauge Painted Roofing Sheets, at $1.85 per square, and Galvanized Roofing Sheets, No. 28 gauge, $3.25 per square, for 2-in. corrugations. These prices are for carload lots, jobbers charging the usual advances.

Hoops and Bands.—We are advised that the new demand is fairly heavy, but shipments by the mills are mostly on contracts on which buyers are specifying freely. We quote: Steel Hoops, 2c., and Bands for all purposes at 1.60c., base, half extras, as per Standard Steel card. These prices are for carload lots, f.o.b. Pittsburgh, plus full tariff rail rate to point of delivery, an advance of $2 a ton being charged for less than carloads.

Cotton Ties.—A small tonnage in Cotton Ties continues to be placed, but the larger trade is covered on contracts given to the mills some time ago, on which shipments are being made very freely. We quote Cotton Ties in small lots at 96½c. per bundle.

Tin Plate.—Conditions in the Tin Plate trade as regards contracts for last quarter of the year delivery do not show much betterment. The extreme lateness of the fruit crop, and the fact that it will be lighter than last year, are causes for delay by canners in placing their contracts. It is believed that many of these belated contracts will be placed early in September. The Washington Tin Plate Company has been organized at Washington, Pa., and will operate the mills at that place, formerly owned by the McClure Company. We quote $3.90 for 100-lb. Cokes, 14 x 20, f.o.b. Pittsburgh, terms 30 days, less 2 per cent. off for cash in 10 days, on which price a rebate of 5c. a box is allowed for carload and larger lots.

Bars.—Demand for Iron Bars is only fairly active, and some of the Eastern mills are actively seeking new business. We are advised that the demand for Steel Bars continues fairly active, but is not so heavy as some time ago. The car interests complain that the railroads are placing orders for but few cars, and for this reason the Steel Bar mills are not getting any large contracts from the car builders. We quote Iron Bars at 1.70c., Pittsburgh, but on desirable specifications, and for large tonnage, this price would probably be shaded $1 a ton. Steel Bars for prompt shipment continue to command premiums of $2 to $3 a ton. We quote Steel Bars for forward delivery at 1.60c., base, half extras, f.o.b. Pittsburgh.

Spelter.—Very little new business is being offered and prices are weak and lower. We quote prime grades of Western Spelter at 5.60c. to 5.62½c., St. Louis, equal to 5.72½c. and 5.75, Pittsburgh. So little business is being offered that it is somewhat doubtful just what price would be made on a firm offer and for a large tonnage.

Merchant Steel.—No large tonnage is being placed, orders being received by the mills being mostly for small lots and early shipment. Large consumers are specifying quite freely on contracts, but not so liberally as some time ago, and the mills are gradually catching up on back orders. We quote: Smooth Finished Machinery Steel, 1.85c. to 2c., depending on quality; Flat Sleigh Shoe, 1.65c. to 1.75c.; Cutter Shoe, 2.15c. to 2.20c.; Toe Calk Steel, 2.10c. to 2.15c.; Railroad Spring Steel, 1.75c. to 1.80c.; Crucible Tool Steel, 6c. to 8c., for ordinary grades, and 10c. and upward for special grades. We quote Cold Rolled Shafting at 50 per cent. off in carloads, and 45 per cent. in less than carloads, delivered in base territory.

Railroad Spikes.—The demand for standard sizes of Spikes continues light, the railroads having placed but little new tonnage for some time. For this reason some of the larger makers of Spikes are actively seeking new business and for early delivery. We quote standard sizes of Railroad Spikes at $2 to $2.05 and smaller sizes at $2.25 to $2.30 per 100 lb., f.o.b. Pittsburgh.

Boiler Tubes.—The demand for Locomotive Tubes is not so active as it was by any means, but for Merchant Tubes a moderate tonnage is being placed. Discounts are as follows:

Boiler Tubes.

	Iron.	Steel.
1 to 1½ in	42	47
1¾ to 2¼ in	42	59
2½ in	47	61
2¾ to 5 in	52	65
6 to 13 in	42	59

2½ in. and smaller, over 18 ft. long, 10 per cent. net extra.
2¾ in. and larger, over 22 ft. long, 10 per cent. net extra.

Merchant Pipe.—New business being placed in Merchant Pipe is not so heavy as it was some time ago, but the National Tube Company and other leading makers are filled up for three months at least. Shipments of Pipe by

the mills are now in excess of orders and specifications, this being the first time this has been the case for some months. No large Pipe lines have been placed, and several contemplated lines have gone over until next year, the mills being so well filled up that they were not able to make deliveries wanted. Prices are firm, as follows:

Merchant Pipe.

	Jobbers, carloads. Steel. Black.	Galv.
	%	%
⅛ to ¼ in.		
⅜ in.	65	49
½ in.	67	53
¾ to 6 in.	69	57
7 to 12 in.	73	63
Extra strong, plain ends:	70	55
⅛ to ⅜ in.		
½ to 4 in.	58	46
4½ to 8 in.	65	53
Double extra strong, plain ends:	61	49
½ to 8 in.	54	43

To the large trade all above discounts are subject to 1 point on the base and 5 per cent. on the net.

Official discounts on Iron Pipe, which are shaded one-half point or more to the large trade, as are follows, f.o.b. Pittsburgh:

Standard Genuine Iron Pipe.

	Black.	Galv.
	%	%
¾ to 6 in.	67	57
½ in.	62	50
¾ in.	60	42
⅛ and ¼ in.	58	42
7 to 12 in.	62	47

Extra Heavy Iron Pipe, Plain Ends.

⅛, ¼ and ⅜ in.	62	40
½ to 4 in.	59	47
4½ to 8 in.	55	42

Coke.—The demand for Furnace Coke continues active, and owing to the scarcity in supply of genuine Connellsville Furnace Coke, it is bringing relatively high prices, being held at $2.75 to $2.85 a ton at oven. Furnace Coke made in the Klondike District, which runs a little higher in sulphur than genuine Connellsville, is being quoted at $2.60 to $2.65 a ton at oven. Genuine Connellsville 72-hr. Foundry Coke is held at $3.15 and up to $3.50 a ton at oven. Very few contracts are being placed for either Furnace or Foundry, consumers being covered. Out of 35,165 ovens in the Upper and Lower Connellsville regions, 32,748 were active last week and 2417 idle, and the output of both regions was 407,735 tons.

Scrap.—The market is practically lifeless, little material changing hands. Consumers believe that by holding off they will eventually be able to buy Scrap at lower prices, and are therefore keeping out of the market. In the almost entire absence of sales, we quote nominally as follows: Heavy Steel Scrap, $17.75 to $18, for Pittsburgh, Steubenville or Sharon delivery; No. 1 Railroad Wrought Scrap, $17.25 to $17.50; Rerolling Rails, $18.25 to $18.50; No. 2 Wrought Iron Scrap, $17 to $17.25; Bundled Sheet Scrap, $15.75 to $16; No. 1 Busheling Scrap, $17 to $17.25; No. 2, $13.75 to $14; Old Steel Rails, short pieces for Open Hearth use, $17.75 to $18; Low Phosphorus Melting Stock, $22; Cast Iron Borings, $13.25 to $13.50; No. 1 Cast Scrap, $20; Grate Bars, $15.75 to $16; Stove Plate, $15.75 to $16; Steel Axles, $22.25 to $22.50; Old Car Wheels, $25. All these prices are per gross ton, f.o.b. buyer's mill, Pittsburgh, unless otherwise stated.

The Lees-Williams Company has moved its office from the Wabash Building to the House Building, Smithfield and Water streets, Pittsburgh. It has also secured space in the Terminal Warehouse, South Side, Pittsburgh, where it carries a stock of Shelby Seamless Steel Tubing.

The office of the Parker Boiler Company has been removed from the Frick Building to the Machesney Building, Pittsburgh. J. R. Robinson is in charge.

Cleveland.

CLEVELAND, OHIO, August 20, 1907.

Iron Ore.—Ore is coming down from the upper lake ports more freely than it was last week, and in larger quantities than at any time since the strike, but the movement is considerably below the June record. Ore shipments from Ashland, Escanaba and Marquette, where there was no labor trouble, are very heavy, but it is not expected that the total movement will be any heavier during August than it was last year, because of the falling off in shipments from Duluth, Superior and Two Harbors. That means that on September 1 shipments will be only about 500,000 tons ahead of the same time in 1906, and if the 40,000,000-ton mark is reached for the season a gain of 2,000,000 tons will have to be made from September 1 to the close of the season. There are some inquiries for Ore and the sale of 50,000 tons of Non-Bessemer Ore is noted during the week to two consumers, who found that they needed more than they had purchased. The sales were made at the market price. The supply of cars is short and the work of unloading cargoes somewhat slow. There is plenty of boat tonnage in the market and more boats could be placed in the Ore trade if they were wanted. Ore prices are firm and stationary, being as follows at Lake Erie docks, per gross ton: Old Range Bessemer, $5; Mesaba Bessemer, $4.75; Old Range Non-Bessemer, $4.25; Mesaba Non-Bessemer, $4; Siliceous Bessemer, $2.75; Siliceous Non-Bessemer, $2.35 to $2.60.

Pig Iron.—Sales during the week have been limited to a few small lots for prompt shipment, and the market shows a tendency to further weakness. Some sales of No. 2 Foundry have been made to regular customers in small lots at $22.50, at furnace, for immediate delivery. As high as $23.50 has been paid for car lots for spot Iron. Owing to the easing up of the foundry situation some of the melters are accumulating Iron a little faster than needed, and are asking furnaces to suspend shipments from 30 to 40 days, and to extend their contracts for that length of time. Other foundries, however, are still asking that their Iron be forwarded promptly according to contract. One furnace was asked to deliver during August 1000 tons of Malleable Iron under contract for September delivery. There have been a few inquiries for Foundry Iron for the last quarter delivery, but no sales. Buyers are looking for lower prices and are disposed to purchase only for their immediate needs until the market becomes settled. Furnacemen appear satisfied with the situation and are making no efforts to sell Iron for next year's delivery, but on the other hand are receiving no inquiries for that delivery. For the first quarter and first half of 1908 they are quoting Northern No. 2 Foundry Iron at $21.50, at furnace. There is an inquiry in the local market for 2000 tons of Basic Iron for prompt delivery. A price of $21.50 or perhaps a little lower will be quoted. Quotations for the fourth quarter of 1907, f.o.b. Cleveland, are as follows:

Bessemer	$22.90
Northern Foundry, No. 1	$23.00 to 23.50
Northern Foundry, No. 2	22.50 to 23.00
Northern Foundry, No. 3	22.00 to 22.50
Gray Forge	21.90

Coke.—The market is firmer, and there is a good demand for both Furnace and Foundry Coke. Owing to the heavy sales during the past week or two some of the producers are pretty well sold out, and there is a scarcity of standard brands. We quote the best grades of Connellsville Furnace Coke at $2.75 to $3, at oven, and 72-hr. Foundry Coke, at $3.15 to $3.25, at oven.

Finished Iron and Steel.—New business has been light, but specifications have continued to come in heavily on Structural, Steel Bar and Plate contracts. The demand for Structural Material is holding up well, and some of the mills are not in as good shape to make deliveries. For the first time in several weeks some orders have been placed for Structural Material for prompt delivery at premium prices. Steel Bars are scarce owing to the heavy demand, and mills are not catching up. Deliveries can be had in from two to four months, according to specifications. The Plate situation remains firm and some orders are still being placed at $2 a ton premium for prompt delivery. No further Plate tonnage has been placed on boat contracts. Several additional boats for 1908 delivery are projected, but the deals have not yet been closed, and the delay is probably due to difficulty in financing the projects, owing to the condition of the money market. Bar Iron is weaker, and in light demand. Local mills can make prompt shipments, and are quoting Iron Bars at 1.70c., Cleveland, although for good sized orders for out of town shipment a price of 1.60c. Cleveland, could probably be secured. Other mills are quoting Iron Bars at 1.60c., Pittsburgh, or 1.70c., Cleveland, and can make deliveries in from six to eight weeks. Forging Billets are easier. Sales in car lots are noted at $36 and $37, Cleveland, for quick delivery. The Sheet situation is easier and some independent mills can make reasonably prompt deliveries. There is an inquiry in the local market for several hundred tons of Boiler Plates for prompt delivery. The contract for the Structural Material for a new plant for the Sandusky Portland Cement Company, 600 tons, has been awarded to the Bellefontaine Bridge & Steel Company, Bellefontaine, Ohio. A new market house soon to be erected in Cleveland will take about 800 tons. We quote Beams and Channels at 1.80c., base, Cleveland, for carload lots; Plates, ¼ in. and heavier, carload lots, 1.80c., base; Steel Bars, 1.70c., for car lots, with half extras. Warehouse business shows some falling off. Jobbers have reduced the price on Iron Bars for out of town trade to 1.95c. We quote Steel Bars out of stock, at 1.95c., and Iron Bars at 1.95c. to 2c. Warehouse prices on Sheets are as follows: Blue Annealed, No. 10, 2.30c.; No. 28, One Pass Cold Rolled, 3.05c.; No. 28 Galvanized, 4.05c. We quote Beams and Channels, out of stock, at 2.25c., base. The warehouse price on Boiler Tubes, 2¾ to 5 in., is 64 per cent. discount, and on Black Merchant Iron Pipe, base sizes, 67 per cent. discount.

Old Material.—Prices show an inclination toward further weakness, although nominal quotations are practically

the same as last week. The mills are taking what material they have under contract, but there is no demand for any kind of Scrap, even in small lots for immediate needs. Foundries are also making no inquiries for Scrap. All consumers seem to be holding off for a further decline in prices, and to make sales at the present time dealers would have to quote lower prices than those named below. Dealers' supplies are running rather low, as they have ceased buying until a demand appears. Dealers' prices to the trade per gross ton, f.o.b. Cleveland, are as follows:

Old Steel Rails	$16.50 to $16.75
Old Iron Rails	22.00 to 22.50
Steel Car Axles	21.50 to 22.00
Old Car Wheels	23.00 to 24.00
Relaying Rails, 50 lb. and over	27.50 to 28.00
Relaying Rails, under 50 lb.	30.00 to 31.00
Heavy Melting Steel	16.00 to 16.50
Railroad Malleable	17.75 to 18.25
Agricultural Malleable	15.50
Light Bundled Sheet Scrap	13.50 to 14.00

The following quotations are per net ton, f.o.b. Cleveland:

Iron Car Axles	$26.00 to $27.00
Cast Borings	10.50 to 11.00
Iron and Steel Turnings and Drillings	12.00 to 12.50
Steel Axle Turnings	14.00 to 15.00
No. 1 Busheling	14.50 to 15.00
No. 1 Railroad Wrought	16.00 to 16.50
No. 1 Cast	18.00 to 19.00
Stove Plate	14.50 to 15.00
Bundled Tin Scrap	10.00

Cincinnati.

FIFTH AND MAIN STS., August 21, 1907.—(*By Telegraph.*)

Pig Iron.—General market conditions are extremely quiet, and show a tendency to weakness. It seems to be impossible to interest consumers along the line of future requirements, and the practice of buying from hand to mouth continues to a great extent. There is, however, one peculiarity about the situation, that is causing more or less comment, and that is that notwithstanding the almost utter absence of anything in the way of trade, consumers continue to press for shipments already due on contracts and which are actually needed to continue running their plants. Prices this week show a slight decline, and while the Southern furnaces are said to be strong at $20, Birmingham, for delivery during this month and next, it is nevertheless a fact that Iron can be bought at $19.50 as a general proposition, and that under certain conditions $19 is being done. There has been scarcely enough business for fourth quarter delivery to indicate what the exact situation is for that delivery, but it looks as though $19 was a fair quotation for the balance of the year. The Southern furnaces are said to have considerable low grade Iron on hand that they are willing to substitute for the regular Foundry grades, caused by some furnaces working badly. High Silicon grades are in more demand than Foundry grades, and while apparently not in bountiful supply, enough is available to meet present requirements. One large Indiana consumer bought 200 or 300 tons again this week, apparently unwilling to trust the future to any great extent. A southern Ohio concern bought 300 tons of Gray Forge and 300 tons of Malleable for nearby delivery. Outside of these sales the business has been coming forward in 100 and 200 ton lots, and the aggregate is small. Freight rates from the Hanging Rock District to Cincinnati are $1.20, and from Birmingham, $3.25. We quote, f.o.b. Cincinnati, as follows:

Southern Coke, No. 1	$23.25 to $23.75
Southern Coke, No. 2	22.75 to 23.25
Southern Coke, No. 3	22.25 to 22.75
Southern Coke, No. 4	21.50 to 22.00
Southern Coke, No. 1 Soft	23.25 to 23.75
Southern Coke, No. 2 Soft	22.75 to 23.25
Southern Coke, Gray Forge	20.25 to 20.75
Southern Coke, Mottled	19.25 to 19.75
Ohio Silvery, 8 per cent. Silicon	29.15 to 29.65
Lake Superior Coke, No. 1	23.15 to 23.65
Lake Superior Coke, No. 2	22.65 to 23.15
Lake Superior Coke, No. 3	22.15 to 22.65
Car Wheel Irons.	
Standard Southern Car Wheels	$29.00 to $29.50
Lake Superior Car Wheel	27.50 to 28.00

Coke.—The market is fairly active, with no special contracts reported. Prices are a shade firmer. We quote best brands of Connellsville and Virginia Foundry from $3 to $3.25, f.o.b. ovens.

Finished Iron and Steel.—New business during the week has been somewhat light, Structural specifications having shown a slight decrease. We quote, f.o.b. Cincinnati, as follows: Iron Bars, carload lots, 1.80c., with half extras; small lots from store, 2c., with full extras. Steel Bars, carload lots, 1.75c., half extras; smaller lots from store, 1.95c., with full extras. Base Angles, carload lots, 1.85c. Beams and Channels, carload lots, 1.85c., base. Plates, ¼-in. and heavier, carload lots, 1.85c., base, and smaller lots from store, 2.25c. Sheets, No. 16, carload lots, 2.05c., and smaller lots from store, 2.60c.; No. 14, carload lots, 1.95c., and smaller lots from store, 2.50c. Steel Tire, 1 x ¼ in. or heavier, 1.95c., in carload lots.

Old Material.—The Scrap market is easy, and the tonnage sold has been light. Prices are inclined to fluctuate considerably according to circumstances. We quote dealers' prices, f.o.b. Cincinnati, as follows:

No. 1 R. R. Wrought, net ton	$16.50 to $17.00
Cast Borings, net ton	9.00 to 9.50
Steel Turnings, net ton	12.00 to 12.50
No. 1 Cast Scrap, net ton	17.50 to 18.00
Old Iron Axles, net ton	25.50 to 26.00
Old Iron Rails, gross ton	24.00 to 24.50
Old Steel Rails, long, gross ton	17.50 to 18.00
Relaying Rails, 56 lb. and up, gross ton	27.50 to 28.00
Old Car Wheels, gross ton	24.00 to 24.50
Low Phosphorus Scrap, gross ton	19.50 to 20.00

Iron and Industrial Stocks.

NEW YORK, August 21, 1907.

The stock market was in such a feverish condition on Wednesday of last week that the announcement of the failure of the Pope Mfg. Company was sufficient to start a stream of furious liquidation. The failure caused widespread apprehension that financial troubles were to be expected in other quarters of the manufacturing and commercial world. Some recovery occurred on Thursday, but this was followed by renewed weakness on Friday, when rumors were circulated reflecting on the financial position of the Allis-Chalmers Company, and stocks again fell heavily. The officers of that company, however, quickly corrected the reports, stating that the company's assets were equal to double its liabilities. Since then the stock market has been in a decidedly unsettled condition, easily reflecting rumors of all kinds, especially the Administration's attitude toward large corporations. The range of quotations on active stocks from Thursday of last week to Tuesday of the present week was as follows: United States Steel common 29¼ to 31⅝, preferred 91⅛ to 94⅜; Car & Foundry common 35⅞ to 38¼, preferred 93 to 97½; Locomotive common 49½ to 52¼, preferred 99 to 101; Steel Foundries preferred 29 to 32; Colorado Fuel 22⅛ to 24½; Pressed Steel common 25 to 27½, preferred 84⅛ to 86; Railway Spring common 31¾ to 35; Republic common 18¾ to 20¾, preferred 68½ to 74½; Sloss-Sheffield common 40 to 48; Cast Iron Pipe common 27½ to 29, preferred 76 to 78¼; Can preferred 43 to 46½. During the flurry on Friday the common stock of the Allis-Chalmers Company fell to 4 and the preferred to 15½, but the common subsequently recovered to 6⅝ and the preferred to 20. Bethlehem Steel preferred touched 32 on Saturday, which is the lowest point at which it has sold during this period of decline. General Electric, during the week, sold down to 122½, and Virginia Iron, Coal & Coke down to 45. These figures show how severely industrial stocks have been depressed. Last transactions up to 1.30 p.m. to-day are reported at the following prices: United States Steel common 30⅝, preferred 92⅞; Car & Foundry common 37, preferred 94½; Locomotive common 51, preferred 99; Steel Foundries common 5¾, preferred 28; Colorado Fuel, 23½; Pressed Steel common 26½, preferred 86; Railway Spring common 35; Republic common 18½, preferred 69½; Sloss-Sheffield common 47; Tennessee Coal 135; Cast Iron Pipe common 28½; Can common 4½, preferred 43.

A recent statement shows that the Buffalo & Susquehanna Iron Company, Buffalo, N. Y., earned $719,244 net in the fiscal year ending April 30, 1907. Interest charges were $216,670, leaving $502,574 for surplus. In the first two months of the present fiscal year the company earned a surplus of $137,633, or at the rate of $825,000 a year. Since the company acquired the Hiawatha mine and adjoining property in the Iron River District explorations have brought to light a large deposit of non-Bessemer ores.

New York bankers recently offered for sale a block of the Griffin Wheel Company's 6 per cent. cumulative preferred stock, subject to call at 125. There is outstanding $7,000,000 common stock, on which dividends of about 10 per cent. a year have been paid. Plans were filed in March last for a $350,000 addition to the company's plant at Pullman, Ill., and it is said that when all the additions are completed they will include machine shops, &c., and will have cost about $1,000,000.

An order was entered August 14 in the Superior Court at New Haven, Conn., authorizing H. Stuart Hotchkiss and Frederick B. Farnsworth, receivers of the National Wire Corporation, to turn over the assets to the trustees appointed by the bankruptcy court. The receivers' final account shows receipts from the commencement of the receivership last December to July 31 amounting to $451,169.84, disbursements of $259,689.85, and a balance of $191,479.99. The assets are given as $4,219,687.36, of which $1,167,525.48 is in actual property and the remainder in choses in action and good will. A discharge will be granted next month.

The Wheeling Steel & Iron Company, Wheeling, W. Va., declared a quarterly dividend of 2 per cent., payable August 19.

It is stated that a large part has been sold of the Spanish-American Iron Company's issue of $1,000,000 20-year guaranteed sinking fund 6 per cent gold bonds, secured by mortgage upon the Mayari, Cuba, ore deposits of the

company and railroad, buildings, docks, rolling stock, &c., which are now owned or to be acquired in the development of the property. The bonds are guaranteed by the Pennsylvania Steel Company.

Dividends.—The Barney & Smith Car Company, Dayton, Ohio, has declared a quarterly dividend of 2 per cent. on the preferred stock, payable September 2, and a dividend of 1 per cent. on the common stock, payable September 16.

The Niles-Bement-Pond Company has declared the regular semiannual dividend of 3 per cent. on the common stock, payable 1½ per cent. September 20 and 1½ per cent. December 20; also the regular quarterly dividend of 1½ per cent. on the preferred stock, payable August 15.

The Pratt & Whitney Company has declared the regular quarterly dividend of 1½ per cent. on the prefered stock, payable August 15.

The Republic Iron & Steel Company has declared its regular quarterly dividend of 1¾ per cent. on the preferred stock, payable October 1.

New York.

NEW YORK, August 21, 1907.

Pig Iron.—Buying is confined to hand to mouth requirements. The foundrymen find that each succeeding purchase brings out lower figures and it encourages them to hold off. Under the circumstances it is difficult to judge just what could be done in forward business for larger quantities. In Basic Pig Iron there have been moderate sales at the range of $19 to $19.50, delivered. Some Steel mills are not taking the Iron contracted for at a higher level, and thus some metal is thrown on the market. On the other hand purchases have been made by furnace companies, to cover old contracts. Owing to the withdrawal of the Thomas Iron Company, the Eastern Pig Iron Association will probably be dissolved. We quote, for Northern Irons, at tidewater, $22 to $22.50 for No. 1 Foundry; $20.75 to $21.50 for No. 2 Foundry, and $20 to $20.50 for No. 2 Plain. Southern Iron is nominally $23.25 to $23.50 for No. 2.

Steel Rails.—Sales reported in the week include 1000 tons for the New Orleans Terminal Company, and 1000 tons for the Tacoma Eastern, while scattering sales amounting to 2500 tons were made by one interest. Foreign inquiry is just now of more moment than domestic business.

Structural Material.—Bids for the construction of Piers 60, 61 and 62 of the Chelsea improvement in the North River are to be opened to-day. About 11,000 tons of Steel will be required for this work. Of the 21,000 tons already let the first contract, 8000 tons, went to the Hay Foundry & Machine Company, while the second, 13,000 tons, about the destination of which there has been no little speculation, will be executed so far as the fabrication of Steel is concerned, by the McClintic-Marshall Construction Company. For the Knickerbocker Building, 22 stories, at Broadway and Exchange Place, mentioned heretofore, about 3500 tons will be required. A job that has long been figured on, that promises to come to the fabricators in the near future is the Hudson Companies terminal, at Sixth avenue and Thirty-second street, for its connection with the Pennsylvania Railroad. About 12,000 tons of Steel will be needed. In the more distant future, and yet counted upon as one of the certainties of the vast programme of improvement work now being carried out in and about New York City, is the Hell Gate bridge of the Pennsylvania and New Haven railroads. Fully 80,000 tons of Steel will be required. In connection with the various construction contracts the city of New York has made, or is about to make, financial considerations are now uppermost. Some delays may result from the present embargo in the bond market. The structural mills generally are making fair deliveries, and the bridge shops are turning out work at a record rate for the summer months. In the first half of August the American Bridge Company's bookings were equal to those for the entire month of July, and a good tonnage is likely to be closed in the balance of the month. We quote on mill shipments, tidewater delivery, as follows: Beams, Channels, Angles and Zees, 1.86c.; Tees, 1.90c.; Bulb Angles and Deck Beams, 2c. On Beams, 18 to 24 in., and Angles over 6 in., the extra is 0.10c. Sales out of stock, of material cut to length, are made at 2¼c. to 2½c.

Bars.—A fair volume of inquiries is noted in Bar Iron, some of which call for 500 tons or more. Prices are steady on the basis of 1.60c. to 1.65c., Pittsburgh, or 1.76c. to 1.81c., tidewater, for Best Refined. The firm position of Steel Bars is maintained, with the price on deferred deliveries quoted at 1.60c., Pittsburgh, or 1.76c., tidewater, while earlier deliveries continue to command a premium of $2 or more per ton.

Plates.—The local demand continues rather better for Universal Plates than for Sheared Plates, although sales of the latter are showing some increase, due to a little more activity in shipyards. Consumers are only covering their pressing wants, however, and are not placing contracts for future requirements. Quotations are firmly held as follows for tidewater delivery: Sheared Tank Plates, 1.86c. to 1.96c.; Flange Plates, 1.96c. to 2.06c.; Marine Plates, 2.26c. to 2.36c.; Fire Box Plates, 2.75c. to 3.50c., according to specifications.

Cast Iron Pipe.—Sales are confined to carload lots, and even these are few. Foundries are still well employed on old orders, but new business is beginning to be rather anxiously looked for. The expectations of good contracts coming out for the city of New York are not being realized, as the market for city bonds is decidedly unfavorable at present. Unless new measures are adopted, which will insure the sale of bonds, it is considered inevitable that proposed improvements involving the use of large quantities of Water Pipe will have to be postponed until more propitious times. Prices are continued on the basis of $34.50 to $35 per net ton at tidewater on carload lots of 6 in.

Old Material.—Although the market is not active, it is far from being demoralized. Dealers are not offering any considerable quantity of Scrap, but are inclined to hold what they have until the general condition improves. Such Railroad lists as have recently come out have been readily absorbed. While sales are small, inquiries are rather better. Dealers look for a decidedly improved demand when September opens. Quotations per gross ton, f.o.b. New York, are as follows:

Old Girder and T-Rails for melting	$14.00 to $14.50
Heavy Melting Steel Scrap	14.00 to 14.50
Old Steel Rails, rerolling lengths	16.50 to 17.00
Relaying Rails	26.00 to 26.50
Old Iron Rails	22.00 to 22.50
Standard Hammered Iron Car Axles	27.50 to 28.00
Old Steel Car Axles	19.50 to 20.00
No. 1 Railroad Wrought	17.50 to 18.50
Iron Track Scrap	15.50 to 16.00
No. 1 Yard Wrought, long	15.00 to 15.50
No. 1 Yard Wrought, short	14.50 to 15.00
Light Iron	9.00 to 9.50
Cast Borings	11.00 to 12.00
Wrought Turnings	13.00 to 13.50
Wrought Pipe	12.00 to 13.00
Old Car Wheels	22.50 to 23.00
No. 1 Heavy Cast, broken up	17.50 to 18.00
Stove Plate	14.50 to 15.00
Grate Bars	13.50 to 14.00
Malleable Cast	17.50 to 18.50

Metal Market.

NEW YORK, August 21, 1907.

Pig Tin.—A sharp decline last week, reaching the low level on August 14, when Tin was sold all the way from 36.20c. to 36.35c., brought in a fair amount of business, and, in fact, there was considerable activity up to August 17 in disposing of small lots. Since then there has been more Tin than orders. On August 15 sales were made at 36.77½c. to 36.85c., and on August 16 at 36.55c. to 36.65c. The London operators have apparently given no suport to the market and are not averse to seeing lower prices providing a decline can be brought about without panicky conditions prevailing. There is no disposition to put prices down unduly, but, on the other hand, there is no active support. Since Monday of this week there has been little variation in the matter of price, sales having been made at 37.25c. to 37.30c. Conditions abroad do not look toward higher prices in the near future, although the statistical position is fairly firm. Arrivals since August 1 aggregate 1705 tons and there are afloat for American ports 2342 tons, of which considerably over 1000 tons is scheduled to arrive this month. Some sales of small lots were made to-day at 37.20c. The London market closed easy at £166 12s. 6d. for spot and £166 for futures.

Copper.—As far as actual business is concerned there is little to tell. Some exporters have been fortunate enough to capture orders for small lots for shipment to Europe at about 18.12½c. to 18.25c. for Electrolytic. The one curious thing about these shipments is that they are specified for August, indicating that some consumers on the other side are quite bare of stocks and, in fact, are in urgent need of metal. Advices from Birmingham, England, this morning state that consumers there have been sounding the market for early September deliveries. Actual business in Casting Grades and Lake Copper is at a standstill. Nominal quotations, however, for Lake are 19c. to 19.50c.; Electrolytic, 18c. to 18.50c.; Casting Grades, 17.50c. to 18c. One of the leading manufacturers of Brass is only working four days a week, and other consumers of Copper are working on reduced time. On the other hand, it would not be at all surprising if in the near future some good sized buying orders should be placed which would immediately have the effect of stimulating the market. This would undoubtedly pave the way for a fair buying movement, but until there is some purchase of sufficient magnitude to give temporary confidence in price, the situation is bound to be dull. One who is well informed in trade matters expresses the opinion that it is no time to become hysterical, and even if producers have been accumulating stocks of Coupper they are in excellent financial position, and the producing capacity has not increased enough to make an appreciable difference in the amount of Copper coming into the market. The Lon-

don market opened firm this morning, but declined later, closing at £79 for spot and £76 15s. for futures, and Best Selected at £85. The exports have been light, although the last week shows an appreciable gain, the total amount so far this month being 9841 tons.

Waterbury Average.—The Waterbury average for July was 23c.

Pig Lead.—The market is easy, and business is extremely dull. Shipments can be had in New York at 5.10c. to 5.15c., and in St. Louis at 5c., although in some quarters it is hinted that a bid of 4.95c. would bring business. The American Smelting & Refining Company continues to quote 5.25c. governing old contracts. The London market is easy, at £19.

Spelter.—Prices continue to decline, and the metal can be had at 5.70c., New York. Extreme dullness also prevails in St. Louis, where the Spelter is offered at 5.55c. The London quotation is lower, at £22.

Ferroalloys.—There is little being done, but contracts that were entered into several months ago for 50 per cent. Ferrosilicon and have not been filled are coming into the market, which gives a little strength. These are being placed at $105 to $106 per ton. Ferromanganese is extremely dull, futures having been sold as low as $57, Baltimore. Nearby business can be done at $59, Baltimore

Tin Plate.—The Welsh market has declined sharply 4½d., and Tin Plates are now held in Swansea at 14s. 6d. In this country business is dull, and deliveries are coming forward rapidly. Prices are unchanged, at $3.90, f.o.b. Pittsburgh, and $4.09, f.o.b. New York, for 100 lb. IC Coke Plates.

Antimony.—Dullness, which has been noted so long, continues, and quotations are to a large extent nominal. Cookson's can be had at 10c. to 10½c., Hallett's at 9c. to 9½c., while other grades are quoted at 8½c. to 9c.

Old Metals.—Prices have eased further, dealers quoting their selling prices as follows:

	Cents.
Copper, Heavy Cut and Crucible	17.50 to 18.00
Copper, Heavy and Wire	17.00 to 17.50
Copper, Light and Bottoms	15.50 to 16.00
Heavy Machinery Composition	15.50 to 16.00
Brass, Heavy	11.75 to 12.00
Brass, Light	9.00 to 9.50
Clean Brass Turnings	10.50 to 11.00
Composition Turnings	14.50 to 15.00
Lead, Heavy	4.75
Lead, Tea	4.37½
Zinc Scrap	4.75

A Machine Shop School.

A committee was appointed in pursuance of action taken at the Boston convention of the National Metal Trades Association to consider what measures should be taken by the membership to encourage the trade school movement. It consists of William Lodge, Cincinnati, Ohio; H. N. Covell, Brooklyn, N. Y., and John Kirby, Jr., Dayton, Ohio. The committee has issued a circular to the members of the association asking co-operation with the work of the Winona Technical Institute, Indianapolis, Ind. The institute established a year or two ago a foundry school supported in part by contributions from members of the National Founders' Association, and in a similar way it is proposed to train young men for the machinist trade, and members of the National Metal Trades Association were asked to pledge $3000 a year for four years by subscribing for scholarships. For equipping a first-class machine shop the committee suggests that manufacturers of lathes and other tools might donate such tools. The Lodge & Shipley Machine Tool Company has agreed to donate a lathe worth at least $1000, and other lathe manufaturers are asked to contribute in the same way, these donations being accepted in place of scholarships. Since the foundry school is turning out castings under contracts with various manufacturers, it is suggested that machinery manufacturers place orders with the school for portions of their requirements, paying the market price for the castings on the basis of the same number of hours required in their own shops for the manufacture of such parts, with the hourly shop burden added. This, it is believed, would permit the school shop to make a profit, particularly if the manufacturer placing such contracts is willing to furnish the jig equipment with the work he orders.

The tremendous increase in imports is cutting down the favorable balance of trade. The July figures show that it was almost wiped out in that month, when our exports of merchandise exceeded our imports by only $4,601,291. The total value of the imports was $124,764,063 and of the exports $128,765,354. The export figures for July broke all records for that month, but so also did the import figures. The financial situation, under these circumstances, is not promised much relief this fall by imports of gold.

PERSONAL.

John C. Ostrup has been appointed professor of structural engineering at the Stevens Institute, Hoboken, N. J.

Avery P. Eckert has resigned from the Safety Insulated Wire & Cable Company to become general sales manager of the Duplex Metals Company, Chester, Pa., which operates the Monnot process. His headquarters will be at the Lincoln Trust Building, New York.

William C. Redfield, president of the Sirocco Engineering Company, 138 Cedar street, New York, sailed for Europe August 20, and will probably return October 8. His trip is largely connected with the business of the company, which is now erecting a plant to build Sirocco blowers at Troy, N. Y., that is expected to be ready for operation the latter part of this year. These blowers, originally manufactured in Belfast, Ireland, are used on the finest vessels of the five leading transatlantic lines, as well as on other boats of the same and other lines.

Frederick W. Sivyer, president of the Northwestern Malleable Iron Company, Milwaukee, Wis., has gone abroad for a month's business and pleasure trip.

A. C. Dinkey, president of the Carnegie Steel Company, Pittsburgh, has gone to Canada on a vacation.

Wilbur J. Watson has severed his connection with the Osborn Engineering Company, Cleveland, Ohio, and has opened an engineering office in the Citizens' Building in that city. He will devote himself to the design, inspection and construction of bridges, buildings and special structures.

L. Hoover has resigned as secretary and treasurer of the Tennessee, Coal, Iron & Railroad Company, and is succeeded by W. A. Green, at one time secretary of the Illinois Steel Company, and for the past six months connected with the Tennessee Company at its executive offices in New York. W. D. Truesdale has resigned as auditor of the Tennessee Company, and is succeeded by T. M. Nesbitt, who is auditor for the Southern district of the Republic Iron & Steel Company. The offices of secretary, treasurer and auditor will remain at Birmingham, Ala.

An English Suction Gas Power Plant.—A suction gas power plant consisting of three sets of 50 kw. each, has been running for more than two years in a machine shop in England. The engines are directly coupled to generators, and are governed by hit and miss gear, with an additional throttle governor on the gas inlet. The gas for the three engines is derived from a single suction producer plant. The fire is banked at week ends, and is put out for general overhaul at intervals of two months. A month's running showed a consumption of 22¼ tons of coke at a total cost of $65.27; 106,500 gal. of water costing $10.72; $81.50 for wages; oil to the extent of $8.04; sundries, $3.65; scrubber and purifier renewals, $1.34; interest and depreciation, $109.50; making a total of $280.02. The coke burned per horsepower hour was at an average of 2.22 lb. The total output during this time was about 22,450 hp. hr., making the total cost of power 1.25 cents per unit, or about 1 2-3 cents per kilowatt hour, all expenses being included in the reckoning.

The Merchant & Evans Company, Philadelphia, is distributing an illustrated booklet, which reproduces a paper on the subject of tin roofing, prepared by Powell Evans, president of the company, and which was read before the National Association of Master Sheet Metal Workers in their recent convention at Cleveland. The paper particularly refers to the question of insurance in connection with roofing.

Trade Publications

Electrical Equipment.—General Electric Company, Schenectady, N. Y. Bulletins, &c. The bulletins are as follows: No. 4393C, small moderate speed engine driven revolving field alternators; No. 4394B, form P belt driven alternators; No. 4493, parts of R controllers (indicates the parts by number of 37 different controllers and lists their prices); No. 4494, Edison Gem high efficiency incandescent units with bowl holophanes; No. 4495, General Electric fan motors (a 40-page book treating in detail all of the 1907 types—a supplement deals with direct current type DL fan motors); No. 4496, electric pumping plants; No. 4497, security snap sockets; No. 4498, superseding No. 4379, Thomson single-phase high torque induction wattmeters (describes the latest improved form, claimed to maintain its initial accuracy under all ordinary circumstances); No. 4499, cast grid rheostats, type CG; No. 4500, superseding No. 4293, constant current transformer panels for series arc and series incandescent lighting systems; No. 4501, the electrification of the West Jersey & Seashore Railroad (described in *The Iron Age* November 8, 1906); No. 4502, G. E. knife-blade lever switches, type L, form D-12; No. 4503, CQ generators and balancer sets; No. 4504, the G. E. tungsten lamp for street series lighting (has about one-third the consumption per candlepower of carbon filament lamps); No. 4506, the Edison Gem filament 50-watt lamp (the Gem is a carbon filament metallized, making it more refractory and enduring under high temperatures); No. 4508, commutating pole railroad motors (a type that gives practically sparkless commutation even on heavy overloads); No. 4509, electric train lighting (this system uses a steam turbine driven generator mounted on the locomotive or in a baggage car); No. 4510, electrically operated ratchet driven rheostat switches (a means of remote control); No. 4511, lightning arresters, 1907 types (a new line developed as an elaboration of Professor Thomson's fundamental patents); No. 4512, superseding No. 2188, manhole fuse boxes, types MD and Tailleur; No. 4514, Thomson inclined coil portable indicating instruments, types P and P-2; No. 4515, auxiliary contactor equipments for cylinder controllers; No. 4516, MR circuit breakers (an improved line for electric railroad cars); No. 4517, superseding No. 4336, isolated plant switchboard panels with fuses (for small installations where circuit breakers are not necessary); No. 4518, superseding No. 4412, electric hoists (describes and illustrates numerous applications and brings out their advantages in the way of increased efficiency, compactness and durability); No. 4520, engine type continuous current generators, form R; No. 4521, GE floor outlet boxes and adjustable water tight outlet boxes. Price-list 5163 quotes Gem regular incandescent units and Gem meridian units; 5164, superseding 5162, Thomson recording wattmeters, and 5165, superseding 5149, Edison miniature incandescent lamps (carbon filament). Circular 3557 relates to adjustable terminal ground connectors for grounding secondaries of transformers, &c., and 3556 is a card folder giving an approximate rule for size of wire for three-phase transmission lines.

Concrete Reinforcement.—Expanded Metal & Corrugated Bar Company, St. Louis, Mo. Folder and circular letter. The letter calls attention to the company's corrugated bar for ferroconcrete construction and refers to the folder, which contains a reproduction from a sawed section of a block of concrete in which a corrugated bar had been imbedded. The letter calls attention to the various kinds of construction in which reinforced concrete is of advantage and why, and the particular advantages of corrugated bars as the reinforcing agent in such constructions. It also extends the services of the company's engineering department in an advisory capacity to those who may have work in hand, and invites inquiries for a more complete catalogue containing illustrations of typical reinforced concrete constructions, some formulæ and tables for use in designing.

Punches, Shears, Etc.—Bechem & Keetman, Duisburg, on the Rhine, Germany. Loose leaf catalogue. Size, 7x 10½ in.; pages, 95. A few words concerning organization and agencies are followed by illustrations, with descriptions on facing pages of the various machines made principally for structural steel plants and yards and rolling mills. These include several types of power shears for cutting plates and shapes, hand shears, rotary shears, helve shears, hydraulic shears, metal cutting and slitting saws, punches (single and multiple) of many types, slotters, straightening presses and straightening rolls, stamping machines, roll lathes, hydraulic presses (vertical and horizontal), wheel presses, steam hammers, &c. Many of the machines are of special interest on account of their great size.

Brass and Iron Specialties.—Wm. Powell Company, 2525 Spring Grove avenue, Cincinnati, Ohio. Catalogue. Presents in a thorough and practical manner the company's very complete and modern lines of brass and iron specialties, giving dimensions of each article for which a dimension may be required and explaining in detail the merits of the several specialties. Included is a valuable series of tables and rules giving in concise form information that engineers and shop managers may need in their daily practice.

Water Tube Boilers.—Bigelow Company, New Haven, Conn. Catalogue. Presents the line of Bigelow-Hornsby water tube boilers which the company has recently added to its product, having purchased the American rights for what has come to be a standard type in Great Britain. It states in introduction that no attempt has been made at a complete description of the boiler, but the catalogue goes into a good many details, which are shown in sectional drawings that give an excellent idea of the working and principles of the boiler, including its unit system of tubes. Views of the recently enlarged works are also included in the illustrations.

Air Compressors and Pneumatic Tools.—Chicago Pneumatic Tool Company, Fisher Building, Chicago, Ill. Two catalogues. No. 23 is a book of more than 100 pages and is devoted to Franklin air compressors. It contains descriptive matter and information relating to air compressors, and is illustrated with engravings of the machines and their parts. No. 24 also contains more than 100 pages and covers comprehensively the company's line of pneumatic tools and appliances, including Boyer and Keller hammers, Little Giant drills, sand rammers and hoists. Both books are printed in colors, are conveniently indexed, and are intended to be books of reference as well as catalogues.

Corrugated Concrete Reinforcing Bars.—Expanded Metal & Corrugated Bar Company, St. Louis, Mo. Album. Size 8¼ x 10½ in.; pages 112. Consists for the most part of illustrations in the form of large half-tone engravings of work done with the corrugated bar, but is prefaced and appended with useful information concerning corrgated bars and simple formulæ and tables for use in designing.

Bars, Sheets and Building Materials.—American Rolling Mill Company, Middletown and Zanesville, Ohio. Catalogue. Size 9 x 12 in.; pages 60. The product being such as calls for little description or illustration, the subject matter of this catalogue has mainly to do with the organization and equipment of the company. A large number of illustrations are included and quite a little space is given to describing the company's two plants. At Middletown, Ohio, it maintains a main office, laboratory, steel works, rolling mill, galvanizing works and factory, and at Zanesville, Ohio, the Muskingum branch rolling mill and factory. The interior views give an excellent idea of the facilities at command for converting pig iron and scrap iron into steel ingots, steel sheet bars, black steel sheets and finished building materials. The typographical appearance of the catalogue has been given an unusual amount of attention; all of the illustrations are tinted half-tone engravings, which are particularly effective on the interior views that follow the working processes through the plants.

Cranes.—Alliance Machine Company, Alliance, Ohio. Circular. Gives a list of the largest users of electric cranes in America who placed orders during 1906 with this company. The company reports to have broken all records last year. The fly leaf of the circular enumerates the products—electric traveling, ladle and soaking pit cranes; electric ingot strippers and charging and drawing machines; special electrically operated machines; rolling mill and special machinery; hydraulic riveters, flangers, presses and punches; shears and steam hammers; ore and coal conveying machinery; derricks and automatic buckets; scale cars, and copper converting machinery.

Marine Motors.—Hildreth Mfg. Company, Lansing, Mich. Catalogue. Contains a very complete and detailed description of the Hildreth marine gasoline motors, with illustrations of the parts and the various sizes. The latter include single-cylinder motors of 2, 3 and 5 hp., double-cylinder of 7 and 11 hp., triple-cylinder of 10 and 16 hp., and a four-cylinder motor of 22 hp. Specifications and price-lists, including parts, are given for each size and for solid propeller wheels and shafts, and reversible propeller outfits.

Chain Hoists, Portable Cranes, &c.—D. Round & Son, Cleveland, Ohio. Catalogue No. 38. Size 5 x 6¾ in.; pages 52. The subdivisions of the catalogue deal respectively with chain hoists, trolleys and light cranes, hoisting crabs, derrick winches, chain and chain wheels. Under each various types are shown, as for example under chain hoists there are illustrated Round improved screw hoists and spur-geared blocks, Weston differential blocks and geared blocks and helical screw hoists; and under trolleys and light cranes, I-beam and plain rail trolleys, combined hoists and trolleys, travelers, wall and jib cranes and the Simplex portable crane. A brief description and tables of dimensions and prices are included in each case.

Shaking and Dumping Grates.—Rosedale Foundry & Machine Company, Allegheny, Pa. Pamphlet. Contains an account of the construction, operation and advantages of the Pittsburgh shaking and dumping grate. Illustrations show the main bays of the company's foundry and machine shop, and the back cover calls attention to its other products—rolling mills, steel works and tube mill machinery; heavy special machinery and castings, and the Playford chain grate stoker.

Hydraulic Equipment.—Watson-Stillman Company, 26 Cortlandt street, New York. Leaflets. Sheet 448 concerns a semiportable test pump; sheet 56-2, hydraulic shears for round iron and wire rope, and sheet 427, hydraulic gauges.

Sheet Metal Working Machinery.—Dreis & Krump Mfg. Company, Halsted and Thirty-second streets, Chicago, Ill. Circulars. Deal with the company's line, which includes steel cornice brakes and light and heavy steel power brakes.

Aluminum and Bauxite.

Statistics of Production in 1906.

WASHINGTON, D. C., August 19, 1907.—The production of aluminum in the United States in 1906 amounted to 14,910,000 lb., or almost exactly twice the output in 1903, according to the annual report of the United States Geological Survey, which has just been completed by E. F. Burchard. The production of aluminum, which was undertaken in 1883, grew very rapidly until 1897. During the next six years the output was maintained at a high figure, but with no important gain from year to year. Since 1903, however, the production has increased largely.

The growth of the industry is shown by the following table, which gives the production quinquennially in the United States since the beginning of the manufacture of aluminum:

	Pounds.		Pounds.
1883.....	83	1900.....	7,150,000
1885.....	283	1905.....	11,347,000
1890.....	61,281	1906.....	14,910,000
1895.....	920,000		

By Whom Aluminum Is Made.

The growth of the aluminum industry in the United States coincides with the development of the Pittsburgh Reduction Company, the name of which has recently been changed to the Aluminum Company of America. Operating under the patents of Charles M. Hall, the present vice-president of the company, the establishment and development of the aluminum industry have greatly reduced the price of aluminum to consumers, for prior to Mr. Hall's invention in 1886 the price of imported aluminum in our markets was about $15 per pound. Recent plans of the Aluminum Company of America include the erection of a model factory town, comprising 200 new houses for its employees at its factories in Massena, N. Y., and a continuous mill for rolling aluminum sheets at its plant at New Kensington, Pa. Ordinarily this company supplies its products in the form of ingots, the rolling and stamping and the production of aluminum utensils being distinct lines of industry carried on by independent manufacturing concerns, although the company has supplied one manufactured product in large quantities, viz., aluminum wire.

A fact of considerable significance to the aluminum industry at large concerns both the Hall and Bradley patents, under which aluminum production in this country is now carried on. According to the United States Patent Office records the Hall patent, No. 400,766, was granted April 2, 1889, for a term of 17 years, and has neither been renewed nor extended. The Bradley patent, No. 468,148, is due to expire February 2, 1909, it having been granted February 2, 1892, for a term of 17 years. These patents cover the method of applying heat to the bauxite in the furnace, and they so cheapened the cost of producing aluminum, as compared with the cost of the old crucible method, as to put the latter method out of competition.

Already there are projects under way which, if realized, will place in the field several competitors for the aluminum trade. One of these will be located on the Cumberland River, about 25 miles below Williamsburg, Ky., where there is a fall approximating 65 ft. in the river. The enterprise involves the construction of a dam to back the water some miles and give a water storage ample to provide 20,000 hp. at any season of the year.

The demand for aluminum is so active as to cause a continued shortage on the market. The rapidly increasing variety of uses for aluminum is probably responsible for this condition, for there has been no lack of preparation and effort on the part of manufacturers, both domestic and foreign, to supply the metal. The supply of aluminum cannot be increased at will, as is the case with many commodities.

The Production of Bauxite.

The production of bauxite, the ore from which aluminum is extracted, amounted in 1906 to 75,332 gross tons, valued at $368,311. Compared with the production in 1905 of 48,129 tons, valued at $240,292, the production in 1906 has increased 27,203 tons, nearly 57 per cent., while the average price per ton remains nearly the same. A reduction of perhaps 10 cents per ton is the average difference noted in the 1906 price as compared with that of 1905.

The principal deposits of bauxite in the United States have been found in Arkansas, Georgia and Alabama. During 1906 bauxite was discovered in Tennessee, Virginia and Pennsylvania, far north of the deposits previously known. It is noteworthy, however, that although these new discoveries extend the area known to contain bauxite the general location, relations and character of the deposits fulfill the conditions described by survey geologists a decade ago—that is, the bauxite is invariably associated with cambrian or cambro-ordovician rocks, such as the Knox or Chenandoah limestone of the valley regions, and in association with faults, so that the newly found ore bodies correspond closely to the type described by C. W. Hayes from Georgia to Alabama.

In Tennessee developments have begun of deposits on Missionary Ridge, at East Lake and Sherman Heights, suburbs of Chattanooga. Bauxite has been noted in California, in Shasta County, and also in Kentucky, in Edmonson County. The use of low grade bauxite for the manufacture of refractory brick and prospective new developments in the aluminum industry have stimulated interest in supplies of bauxite, so that it is probable that the promising districts will be well investigated in the near future.

The Georgia-Alabama bauxite district extends along Coosa Valley from the vicinity of Summerville or Adairsville, Ga., to Jacksonville, Ala., and lies in Bartow and Floyd counties, Ga., and Cherokee County, Ala. Not the whole of the district is developed, however, nor even well prospected, so that from time to time the discovery of new deposits may be expected. Active mining is now carried on about three centers—Hermitage and Cave Springs, Ga., and Rock Run, Ala. Near Hermitage two mines are operated by the Republic Mining & Milling Company of Philadelphia—namely, the Julia, 5 miles east, the Ward mine, 2 miles south of Hermitage. The Aluminum Company of America is working the South Watters, one of a group of several mines 3 miles south of Hermitage, and J. H. Hawkins of Rome, Ga., a pioneer in the bauxite business, maintains a steady output from his mine 5½ miles southeast of Hermitage. Near Cave Spring a mine is operated by the National Bauxite Company, and the Aluminum Company of America mines ore in the same vicinity. The National Bauxite Company has recently completed a plant at Rome, where it treats the ore mined near Cave Spring and Adairsville. This same company is also developing the deposits near Chattanooga, Tenn. Twelve miles south of Rome is a small mine, the Bigelow, owned by Harrison Brothers of Philadelphia. Near Rock Run, Ala., the Republic Mining & Milling Company operates a mine.

Bauxite Brick.

Bauxite has proved to be of great value as a basic refractory material. It is used most conveniently in the form of bricks for this purpose. The Berger patent covers a process for making these bricks. Natural high alumina low silica bauxite from Arkansas is used, bonded by a small percentage of plastic fire clay, sodium silicate or lime. The bricks contain from 88 to 90 per cent. of alumina and from 10 to 12 per cent. of ferric oxide, silica and titanic acid. The percentage of silica can be reduced to 6 or 8 per cent. by the use of a bond free from silica, so that the brick is not appreciably detrimental to basicity. Bauxite brick seems to be especially adapted for the linings of basic open hearth steel furnaces. The highest grade is used in the floor and walls up to the slag line, protected by a bed of calcined bauxite. Above the slag line cheaper brick with a lower percentage of bauxite can be used.

In addition to its use for open hearth furnaces bauxite brick has proved successful for other uses, two of which are as a lining for rotary Portland cement kilns and as a lining for lead refining furnaces. W. L. C.

The Machinery Trade.

NEW YORK, August 21, 1907.

While there has been something of a lull in the demand for machinery equipment during the last 10 days, dealers do not ascribe the conditions to any other cause than the usual expected summer dullness, and when it is remembered that the July business in general was decidedly larger than was expected, a falling off in orders should not cause any great surprise. Business on the whole is remarkably good for this time of the year, and taking in consideration the fact that there is no buying being done for any large enterprise, the trade should be satisfied with the returns it is getting. The complaint is being made that collections are somewhat slow, and it is probable that recent large failures have made buyers somewhat cautious, although this does not include the smaller manufacturers, whose inquiries indicate that they have confidence in the future and will continue to spend money in the trade. As a matter of fact most of the buying which has been done in this vicinity during the last few months was for smaller manufacturers. Only one large interest contributed materially to the dealers' business.

The Baltimore & Ohio Railroad is still holding off on the large list which was placed before the trade several weeks ago, and it is thought that it cannot be long now before orders begin to come in. The General Electric Company has completed arrangements for acquiring a large tract of ground at Erie, Pa., on which it will establish an extensive plant, and as it has been announced that work will be begun this fall a large amount of business can be expected from that source in the near future.

A machinery man who returned from a visit through the principal manufacturing districts of the South is enthusiastic over the outlook for future business there. There is a decided feeling of confidence among the manufacturers there, and the visitor declared that there will be plenty of trade from that source for the next few years. This is particularly true with Southern railroads, and the dealer in question predicted that during the next few months some profitable business will come from that source.

The Department of Docks and Ferries has rejected the bids submitted on August 9 for furnishing a number of machine tools, for the reason that most of the bidders did not comply with the stipulations, and the list has been readvertised and bids will be opened on Thursday, August 27. It is understood that few dealers put in propositions. The security required is $11,200, and the more important items of the list, which is a large one, are as follows: One horizontal boring and milling machine, one full universal radial drill, to drill to the center of a circle 10 in. in diameter; one 36 in. by 10 ft. open side planer, one 15-in. crank slotting machine, one No. 3 universal milling machine, one 800-lb. single frame steam hammer, one special universal grinding machine, one drill grinding machine, one 36-in. planer, one double punch and shear, throat of shear to be 24 in. and throat of punch 18 in.; one set of plate bending rolls, to have a capacity for steel plates ¼ in. thick and 84 in. wide; one band saw, with 38-in. wheels; one back geared vertical drilling and boring machine, with capacity to drill 2¼-in. hole; one improved No. 2 mortiser and borer, one No. 2 iron top mill saw table, one triple geared 36 to 90 in. sliding bed gap lathe, one single head threading machine, to cut threads on diameters from ½ to 2½ in.; one shaper, with single traveling head, 17-in. stroke, with cutter bar 8½ in. wide; one pipe threading and cutting machine, one floor grinding machine, one No. 12 belt driven metal saw, one 14-in. engine lathe, with quick change gear; one 16-in. engine lathe, with quick change gear; one 24-in. engine lathe, with quick change gear; one 18-in. engine lathe, with quick change gear; one 25-in. back geared vertical drilling machine, one 36-in. back geared vertical drilling machine, one 20-in. back geared heavy duty crank shaper, one No. 5 tool grinding machine, one sensitive drill, with 13-in. swing; one jointer and buzz planer, one pump and accumulator, suitable for 1500 lb. per square inch working water pressure, pump to be horizontal duplex, with cylinder 12 x 2¼ x 10 in.

Street Railroad Projects.

The Rhode Island Company, Providence, R. I., will, it is thought, shortly come into the market for requirements for a car barn and repair shop to be built at Woonsocket, R. I., at a cost of $125,000. The contract for the erection of this structure has been let to the E. K. Watson Company, Warren, R. I., and work on the building will be begun very soon. The shop is to be erected to meet the needs of the company in that locality, and because of the fact that the structure is isolated from the company's main shop considerable in the way of repair equipment will, it is thought, be installed. The building will be 127 x 408 ft. in size and will be of mill construction. A space 32 x 100 ft. will be reserved in the structure for general machine shop, blacksmith and electrical repair work. The coach shop will be 40 x 90 ft. in size, and the building will be equipped with the sprinkler system. Two 150-hp. boilers will be installed for heating purposes, and it is probable that motor drives will be used for the machinery equipment. In addition to taking care of the Woonsocket Division, the shops will also serve, when necessary, the Milford, Attleboro & Woonsocket road.

It is probable that the Public Service Corporation of New Jersey will come into the market for equipment for an extension to its power plant at Morristown. Plans are now being prepared for the construction of a building about 59 x 125 ft., and the company proposes to spend $150,000 in the construction and equipment of the building. The Morris & Somerset Electric Company, Morristown, is also preparing for the erection of a power plant in Morristown, to cost a similar amount. Property has been bought adjacent to the Morristown & Erie Railroad, and it is expected to have the plant ready for service by January 1. The officers of the latter company are Samuel S. Childs, president; F. Landon Humphreys, vice-president; Samuel B. Carson, secretary; Peter V. Stryker, treasurer, and John M. Forbes, Luther Childs, Samuel H. Gillespie and William Childs, Jr., directors.

The South Shore Traction Company of Long Island has now obtained franchises giving it an uninterrupted right of way from Patchogue, Long Island, to the New York City line. The company proposes to build an extensive railroad system to compete with the Long Island Railroad for passenger and freight traffic. Arthur P. Heinze has been elected a director of the company and will take an important part in the organization. It is understood that offices are to be established shortly, and arrangements will be made for buying material for building the road.

The Virginia Foundry & Machine Company, Virginia, Minn., is preparing to erect an addition to its plant, which will include a foundry building, 40 x 80 ft.; a machine shop, 40 x 160 ft.; blacksmith shop, 30 x 40 ft., and boiler shop, 30 x 40 ft. The company will install a pattern shop over its machine shop, and the equipment will include a 100-ft. traveling crane in the machine shop, another crane to extend the whole length of the foundry and two 26-ft. hand traveling cranes. A boiler room will be erected in a wing adjoining the machine shop. The buildings will be of brick and corrugated iron construction. The company is anxious to get prices on I-beams for its crane tracks and on the two hand traveling cranes.

Loy & Nawrath, 27-29 Runyon street, Newark, N. J., manufacturers of sheet metal working machinery, leather embossing presses and special machinery, will erect an addition to their present plant, 100 x 125 ft., which will give the company an addition of about 20,000 sq. ft. of floor space. At a recent meeting of the directors of the company an expenditure of $12,000 was authorized for new machinery and equipment, consisting of lathes, planers, radial drills, boring mill, 10-ton traveling crane, and gas engines to develop 50 hp. The engines and crane have been arranged for. It is expected to have the addition completed some time in October. The plant has been running overtime since March 1, and will continue to do so until the addition is in working order.

The Leader Jack Company, which was recently organized at Bloomfield, Ind., is erecting a concrete block building, 80 x 120 ft., and will install equipment to produce about 20 hp., in addition to some light punches, presses, lathes, drills, grinders, forges, and a few special machines. Later on the company contemplates installing a foundry. The officers are Charles E. Benfiel, president; Orland C. Thompson, vice-president; Milford Greene, treasurer, and Clyde O. Yoho, secretary.

The Engineers' Supplies & Brass Foundry Company, which was recently formed at South Bend, Ind., to manufacture valves, fittings and engineers' supplies, will come into the market about the first of the year for machinery equipment for a plant, and in the meantime the company would be pleased to receive catalogues of machinery for the manufacture of that class of goods. Printed matter can be addressed to E. P. Baum, care of the company.

The Martin Metal Mfg. Company has been formed, with a capital stock of $50,000, to establish a plant in Wichita, Kan., to manufacture sheet metal articles, such as galvanized stock tanks, galvanized corrugated culverts, well casing, roof gutters, cornices, skylights, eave troughs, &c. The company will erect a building 50 x 150 ft. in size, of brick construction, and it is expected that machinery will be installed and the factory in running order by fall. The officers are Edward Hockaday, president; F. W. Martin, vice-president and manager; E. T. Batten, treasurer, and I. N. Hockaday, secretary.

The Union Foundry Company, Birmingham, Ala., is making a number of improvements to its plant, which will include the increasing of its foundry capacity one-third by moving its present cleaning room from the foundry into a new structure. The company is building a new modern tarring oven and storage shed. These improvements are being undertaken with a view to diversifying the company's output, the last addition to its line being service pipes for gas and water.

The Crucible Steel Company of America, Pittsburgh, Pa., will install some new equipment in its plant at Syracuse,

N. Y., the capacity of which is to be enlarged shortly. The company contemplates putting in six boilers, with a total capacity of 2500 hp. A new steel building, 50 x 100 ft., is to be constructed. The plans include the adding of some other equipment.

Sanderson & Porter, 52 William street, New York, through their New Orleans office, 323 Barone street, are arranging to erect a new power house at Mobile, Ala., for the Mobile Light & Railroad Company. Plans are now being made for the plant, which it is expected will cost about $100,000, and the buying will be done from the company's New Orleans office. W. A. Haller is in charge of the arrangements.

Business Changes.

The Storm Mfg. Company, Newark, N. J., has moved its plant for the manufacture of dumb waiters and elevators to 40-50 Vesey street, Newark, where the company has erected a new plant which will be used for both manufacturing and office purposes.

The Dayton Pneumatic Tool Company has established an agency with Root, Neal & Co., 178-180 Main street, Buffalo, N. Y., to take care of the largely increased business in that territory. The latter company will carry in stock a complete line of Dayton & Green pneumatic hammers, as well as repair parts and accessories.

Catalogues Wanted.—The mechanical department of the Ralph Sellew Institute, Central Branch, Y. M. C. A., St. Louis, Mo., is establishing a comprehensive catalogue file and requests catalogues on all kinds of power, electrical and machinery equipment. Printed matter should be mailed to H. P. Andrews, M.E., care of the Y. M. C. A., Central Branch, St. Louis.

Philadelphia Machinery Market.

PHILADELPHIA, PA., August 20, 1907.

Sales of machinery and tools in the local market have been somewhat better. The week's business was considered both by merchants and manufacturers to have been fair for the season. While its volume was by no means as large as the average weekly amount some months ago, it showed improvement over that of the last few weeks, and also indicates that there is a fair natural demand, but that at the same time buyers are not going to be rushed into placing orders before the conditions and probabilities of future trade have been given careful consideration. Milling machines, planers, heavy lathes and some of the larger radial drill presses are still hard to get for early delivery, while other classes of tools as a rule are to be had more promptly. Sales of tools of the former classes have not been very extensive, owing particularly to delivery dates. Smaller lathes, presses, planers, shapers and other tools, however, sold better, although most of the busines was done in single tools. One sale of a complete machine shop equipment was to be noted, although the individual tools were small. Special tools have been a little more active, and several builders have booked orders for some fairly good sized ones. The railroads still keep out of the market, and while some inquiries have been before the trade, it is scarcely considered that these will develop into orders at any very early date.

General inquiries are not as good as the trade would like to see. In some cases the market is being felt both as to prices and deliveries, but there is little business other than that of the usual day to day variety in immediate sight.

Manufacturers still keep active, sufficient orders being in hand in some cases to keep plants busy during the remainder of the year, and even beyond, if no cancellations develop. Orders have fallen off materially with most tool builders, but the general expectation is that enough business will come out during the fall months to keep most all the plants fully engaged, although it is believed in a number of cases that somewhat lower prices might rule for some classes of tools.

The foreign demand is unchanged, but little new business in the way of standard machine tools having been closed in this territory. Builders of special tools, however, report a number of good orders from abroad for their various lines, in some of which trade is said to be quite brisk. Those transacting a more or less regularly established business abroad, particularly in such lines as power transmission specialties, report business in a very satisfactory condition.

The second-hand machine tool and general machinery trade has been rather inactive, and the greater portion of the business placed has been confined to the smaller equipment Midsummer dullness is affecting this branch of the trade to a considerable extent, but more active conditions are expected in the early fall. Second-hand engines and boilers are in fair demand only, although quite a fair amount of business is in sight. The tendency to close actual orders, however, is not very strong.

Iron and steel casting plants continue very busy. In some cases future business is not as heavy as it was some time ago, and foundrymen are seeking new business more aggressively. In some classes of gray ironwork castings can be had fairly promptly. Some of the steel casting plants are also said to be in better shape for early deliveries, although practically all have their present capacities fully taken. Machine tool builders report deliveries of machinery castings somewhat improved.

Bids will be received by the Water Commissioners of Cumberland, Md., until August 26, for furnishing and installing complete a 5,000,000-gal. horizontal compound condensing pumping engine of the crank and flywheel high duty type, working under 90 lb. steam pressure at the throttle. Specifications can be seen at the office of the Water Board Commissioners, David Walker, secretary, Cumberland, Md.

The Tindel-Morris Company, Eddystone, Pa., has recently completed an addition 132 ft. long to its No. 3 shop, and installed a new crane and other tools. Business continues to be above the average with this company, and a large number of orders are on its books, which alone will keep it fully occupied for some time ahead. Immediate business is not so large, but from the nature of inquiries received it is believed that a good volume of business will develop during the early fall.

The Energy Elevator Company will remove from its present location, 411-413 Cherry street, to 214-218 New street, where it has purchased a six-story brick manufacturing building having a frontage of 54 ft. on New street and 52 ft. on Bread street. The new plant will enable this company to increase its present capacity fully one-third. The machinery in the present plant will be removed as fast as possible to the new location, and additional equipment added as fast as required. The Energy Company keeps very busy, the demand for its various lines of elevators being fully maintained. It has recently shipped an electric freight elevator of 3000 lb. capacity to Canada; a power freight lift to the Fairbanks Company, Hartford, Conn., and freight, carriage and other elevators to customers in various parts of the country. A large power freight life will also be installed by this company in the new plant of the Grant Gear Works, Marvine and Vine streets, this city.

The Stoever Foundry & Mfg. Company, Myerstown, Pa., reports business very good, and that it is still difficult to meet customers' demands for deliveries. Inquiries keep up fairly well and the outlook for the coming fall is considered very satisfactory. This company is planning for an enlargement to its machine shop toolroom, and will quite likely install some additional machinery in that department in the near future, although exactly what will be required has not been definitely decided upon.

The Philadelphia Roll & Machine Company has recently completed the erection of a 30-ton electric traveling crane and runway in its yard adjoining the foundry. At an early date it will house in this crane with a building, the whole being used as an addition to the main foundry and building. Business is reported in very satisfactory condition. Orders for both sand cast and chilled charcoal iron rolls have been very good, and are largely for those of the heavier class. Orders for mill machinery parts, engine beds and heavy castings have also been booked, and enough work is on hand to keep the plant actively engaged throughout the balance of the year.

The R. S. Newbold & Sons Company, Norristown, Pa., notes very little diminution in the volume of business. The plant continues fully occupied and sufficient business is in hand to keep it busy for some time to come. Active work continues on the erection of the addition to its boiler shop, as well as the new pattern storage plant. The outlook for new business during the fall months is considered good.

Cleveland Machinery Market.

CLEVELAND, OHIO, August 20, 1907.

The local machine tool market is very quiet as far as actual sales are concerned, the business of the past week being limited to the sale of a few single tools. There are a number of fairly good sized inquiries for machine tools for additional shop equipment, and dealers are disappointed that some deals growing out of these inquiries have not yet been closed, as a number of them have been pending several weeks. Concerns that are considering the purchase of new tools, however, are holding off. This delay in making purchases is attributed mainly to the tightness of the money market, which makes the negotiating of loans difficult. A number of new manufacturing concerns have gone no further than to take out incorporation papers, and their delay in taking steps to establish plants is due, in the majority of cases, to trouble in securing capital at the present time to finance their enterprises. Deliveries in some lines of tools show considerable improvement, and dealers are now able to keep their storerooms fairly well filled. While prices of machine tools remain firm, with no indication of a reduction for some time,

some dealers are reported to be making concessions in some cases by paying the freight charges. While dealers do not expect a resumption of the very heavy demand of the past few months, an optimistic feeling prevails in the trade.

The Dean Electric Company, Elyria, Ohio, expects to complete its new plant about October 1, and is in the market for about 50 small tools aggregating about $10,000. In the list of the company's requirements are three milling machines, three No. 6 Whitney hand milllers, three burring machines, four four-spindle drill presses, one two-spindle boring machine, one two-spindle drill press, one multiple four-spindle drill press, one forge, two speed lathes, one 20-in. plain drill press, one 16-in. second-hand engine lathe, one universal grinder with 30 in. center, one 14-in. Hendey lathe, three single spindle drill presses, one 22-in. planer, three hand screw machines, one 12-in. engine lathe, two bench lathes and eight punch presses.

The Sawyer Gear Works, now located in a power block at 102 St. Clair avenue, has commenced the erection of a new plant at 5122-5130 St. Clair avenue. The building will be of brick and two stories high. It will give the company 6000 ft. of floor space.

The Razor Furnace Company, Barberton, Ohio, has been incorporated with a capitalization of $10,000 by H. F. Razor, Clyde O. Razor, Ernest Loeffler and S. A. Decker. It is expected that the company will build a factory in Barberton.

The Indianapolis Steel Roofing & Corrugating Company, Indianapolis, Ind., has changed its name to the Indianapolis Corrugating Company. S. D. Noel has retired from the presidency of the company and has been succeeded by J. Q. A. McClurg, formerly the secretary and treasurer. The company expects to soon begin the erection of a new plant which will probably be ready for operation before the end of the year.

The Western Tube Company, Kewanee, Ill., has opened a district sales office in Cleveland, with E. W. Orr in charge. T. R. Talbot, specialty agent of the company, who has been working through Southern territory, will also be connected with the Cleveland office. The company's offices are located at 1403 Rockefeller Building.

The recently organized Cleveland Wrought Washer Company has secured a site and will at once begin the erection of a new plant. The company has temporary quarters at 1821 Willey street.

The Standard Welding Company, Cleveland, Ohio, is erecting a large plant in that city along the lake shore at West Seventy-sixth street. The company's building will cover an acre and one-half of ground and will contain about 2½ acres of floor space. A power plant of about 1000 hp. capacity will be constructed.

New England Machinery Market.

WORCESTER, MASS., August 20, 1907.

General manufacturing business seems to have been in no way affected by the influences which have been reflected in the stock market during the past week. The receivership of th Pope Mfg. Company created no excitement. While it was known in financial circles that the company was cramped by lack of cash capital and a curtailed credit, the failure came as rather a surprise to most business men, and it is a satisfying commentary on industrial conditions that the announcement of so important an embarrassment should cause not even a ripple of consternation. The manner of reception of the news is emphasized by the fact that this is the fourth New England builder of automobiles to announce a failure or receivership within six months. The first was the Napier Company, Readville, Mass., now out of business. Then came the Grout Automobile Company, Orange, Mass., which is an instance of disagreement among owners rather than financial trouble in the ordinary sense. The third was the Knox Automobile Company, Springfield. Doubtless the affairs of the Grout Company will be satisfactorily adjusted and the business continued. The Knox Company is now in process of reorganization, with excellent progress already made, it is given out. But taken altogether the embarrassment of so important a percentage of a great industry might have been expected to have a more or less depressing influence upon industrial conditions, and that it failed of this effect is distinctly encouraging.

The feeling exists, as has already been mentioned, that the automobile manufacturers will go a little slower than last year in planning their output for 1908. Their increases in manufacturing capacity will be along very conservative lines, it is said. They have been very large buyers of machinery, and doubtless will continue to be good customers. Some of their factories need reorganization of their equipment and system of manufacturing, which will mean new machinery, and, of course, there must always be some growth. New companies are in process of organization, and without doubt some of them will be in the market for equipment in preparation for production for next season's trade.

A practically universal feeling of optimism prevails in the machinery trade in New England. The machine tool builders and manufacturers of other classes of machinery see no reason to change opinions previously formed that business, already very good for August, will resume a higher level in the early fall. The week brought a very fair volume of new business, mostly in small miscellaneous lots and single tools. The machine tool builders report fewer large orders, but an increase in small lots. This is especially noticeable in such lines as presses and other classes of machinery used in general manufacturing. In the place of large orders which have kept entire shops busy for weeks in producing, there are now in the works small lots for a number of customers and occasionally for stock. Such a condition usually means a larger margin of profit, for the tendency must always be to shave prices a little on large orders.

New England is suffering from a protracted drought, which has so reduced many of the streams that steam power has had to be substituted for water. Each succeeding period of this kind results in a large increase in the number of plants which equip themselves with auxiliary steam plants for use in such contingencies, and this summer promises to be no exception to the rule. While most of the large manufacturers who depend upon water for power use steam in connection with it, some of them do not have sufficient steam power to operate their entire works. There are still quite a number of establishments having no steam power plant, and these must close down in time of low water.

There is interest in the trade as to what the machinery requirements of the Fore River Shipbuilding Company will be, if any, in connection with the building of the 20,000-ton battleship for the United States Navy, the formal contract for which has now been awarded. It is presumed that some new heavy machinery will be needed, because of the greater size of the ship and its parts, as compared with vessels previously constructed at the Quincy yards, and because of the effort that will undoubtedly be made to finish the ship in the shortest possible time.

The Old Home week of some of the large cities has had a tendency to put back production in industrial establishments. It has proved to be a succession of holidays, which employers were powerless to prevent. Boston, Providence, Worcester and other cities have suffered, and probably have learned the lesson that they are too large for such festivals. Men would not work; nothing could make them while so much was going on about them. The manufacturers of those places which have the Old Home week still before them have profited by the experience of other cities, and are prparing to shut down for vacation, during which time the customary repairs will be made. Next summer most cities which have had an Old Home week will dispense with the occasion.

The various local strikes in New England are gradually being overcome. Those Providence shops which are affected by the machinists' strike are filling out their full quota of help. Fitchburg shops are making rapid gains in obtaining men to fill the places of the strikers. Some of the drop forgers in the employ of the Page-Storms Drop Forge Company, Springfield, Mass., went on strike recently because of a local difference regarding the employing of help, but this is now practically adjusted, most of the men having returned to work. A number of threatened strikes did not materialize. Altogether, the labor situation has been and is very satisfactory all through the New England States.

The General Electric Company has made the interesting announcement that business in hand at the Lynn Works is nearly 10 per cent. greater than it was at the corresponding date of last year. For weeks the market has heard rumors of serious curtailment of the working force at Lynn, and a certain amount of credence has been given the reports. The company makes a flat denial of any such condition, and states that on the contrary business is better than in 1906. There has been some laying off of unskilled labor, resulting from following the summer custom of dispensing with night shifts. Some men have been transferred to the company's works at Pittsfield, Mass., in the concentration of departments, but on the other hand, work has been transferred from Pittsfield to Lynn. The construction of new buildings for the Lynn Works is being carried on vigorously, and the contract has just been let for a large foundry building for Pittsfield, to be 140 x 300 ft., two stories. At the Lynn Works it is stated that there is entire confidence in the business outlook, as it affects the company's products.

The General Fire Extinguisher Company, Providence, R. I., is very largely increasing its manufacturing capacity, the rapidly increasing demands of the business necessitating important additions to productive capacity. The company has just let the contract for a group of buildings to be erected at Auburn, R. I., as additions to the plant recently purchased from the Washburn Wire Company, and has acquired the foundry business and plant of the A. Carpenter & Sons Foundry Company, Providence, manufacturer of gray iron castings. The new buildings at Auburn will give 120,000 sq. ft. of manufacturing space, in addition to the buildings already on the premises. There will be erected a foundry, 100 x 240 ft., two stories; a pipe shop, 130 x 400

ft., one story, and a machine shop, 100 x 300 ft., one story. The Carpenter foundry is a large one, being one of the most prominent in Rhode Island, and is an old business. The name will disappear and hereafter the plant will be known as the Providence Foundry Department of the General Fire Extinguisher Company. Henry A. Carpenter, who has been president and treasurer of the foundry company for a number of years, will be manager of the department. The foundry has been run exclusively on the General Fire Extinguisher Company's work for some months. With the completion of the new buildings at Auburn, probably about January 1, it is expected that the company will have sufficient foundry capacity to enable it to enter the field of general jobbing work. The machine equipment of the company's present shop will be moved to Auburn when the buildings are completed, and most of the new machine equipment will be of a special nature, so that the additions will not bring the company into the market as an important buyer.

The contract has been let for the new plant which the Royal Typewriter Company is to build at Hartford, Conn. The company will not in the beginning erect all of the buildings contemplated in the general plan of construction. The initial buildings will consist of two structures, each about 50 x 300 ft., four stories, of brick construction, and several smaller buildings. Later on it is intended to increase largely this group of factories. The contract calls for the completion of the work in December, at which time the business will be removed to Hartford from Brooklyn. The building contract calls for the expenditure of about $150,000.

The Cudahy Packing Company contemplates the erection of a refrigerator building at Waterbury, Conn. This type of plant calls for the purchase of quite an extensive and expensive line of machinery, including engines, pumps, compressors, &c.

The Waterbury Clock Company, Waterbury, Conn., has completed plans for a new factory building, 42 x 200 ft., five stories, with wing 42 x 125 ft.

The Warrenton Woolen Company, Torrington, Conn., which recently disposed of its plant to the Coe Brass Company, has acquired a tract of land in Torrington, including frontage on the Naugatuck River and a water privilege. The water power will not be developed, excepting as a source of water for mill purposes, which means that a steam plant will be installed. The company states that while new machinery will probably be installed in the factory when it is ready for occupancy, no definite plans have yet been made.

The business of the Connecticut Gauge Company, Norwich, Conn., manufacturer of speed indicators and other automobile accessories, has been incorporated under Connecticut laws, with capital stock of $2000. Willis Austin is the president and treasurer, and Charles D. Foster, secretary.

The Hobbs Mfg. Company, Worcester, Mass., manufacturer of paper box and wood working machinery, is to erect an addition to its works, consisting of a third story, which will be built on one of the present buildings. The new space will be devoted to the washer tempering and hardening department.

Hill, Clarke & Co., Incorporated, Boston and Chicago, have purchased the machine tools of the Hartford Typewriter Company, Hartford, Conn. This company is no longer manufacturing, and its machinery has been in storage more than four years. There is a miscellaneous collection of some 50 machines, including Brown & Sharpe and Pratt & Whitney millers, Pratt & Whitney lathes, Hendey tools, Whitcomb planers, Waterbury-Farrel presses and Woodward & Rogers sensitive drills.

The Chellis-Hellman Company, Portland, Me., manufacturer of bottle, can and jar caps, is building a new factory.

The Frary Company, Bristol, Vt., manufacturer of small turned wooden goods, is to erect a new factory building, 40 x 150 ft., one story and basement, and a boiler house, dry kilns and other buildings. No new machinery will be purchased at present.

The new Waterbury Casting Company, Waterbury, Conn., of which L. N. Perrault is the head, has awarded the contract for its buildings. There will be a main foundry, 118 x 190 ft., two stories, and power house, 33 x 40 ft. The company will manufacture automobile cylinder castings and other fine gray iron work.

The Builders Iron & Steel Company, 262 Bridge street, East Cambridge, Mass., is in the market for the following list of second-hand equipment: One ⅝ to 1¼ in. bolt cutter, one 2 to 2½ in. bolt header, one bolt pointer and one forging and upsetting machine capable of heading a 2-in. bolt and upsetting a 2-in. rod.

The Waterbury Machine Company, Waterbury, Conn., has contracted for an addition to its plant, which will include a one-story brick building, 40 x 90 ft., to be used for machine shop purposes; a boiler house, 30 x 40 ft., and a coal bin, 25 ft. square. Work on the additions will be begun at once.

The Charles G. Smith Company, Park Building, Pittsburgh, dealer in machinery, has been appointed agent in the Pittsburgh District for the sale of turret lathes made by the Bardons & Oliver Company, Cleveland, Ohio.

Cincinnati Machinery Market.

CINCINNATI, OHIO, August 20, 1907.

Manufacturers are using every effort to catch up on deliveries: some report deliveries better, others normal, and a few state that they could run full time to the first of the year on delayed orders without a bit of new business. An instance of a dealer's extremity and of the strong situation generally may be noted in an agent's letter to a manufacturer of boring machines. The agent was willing to place a large stock order at once if the manufacturer would or could then guarantee him better deliveries. The dealer was told that everybody would be given his turn, as usual, and that his plan would not relieve the tension. The best illustration of the delivery situation at this writing is contained in the statement of a large manufacturer of lathes and drills, who says he expects to be caught up with orders in 60 or at the latest 70 days.

It cannot be said that buying on domestic orders is any more pronounced than in the past few weeks, but the manufacturer contemplates the situation philosophically, attributing the lack of inquiry to the vacation period. An encouraging feature seems to be the demand from San Francisco. Builders of the better types of tools report excellent demand from the Coast metropolis; one concern reporting that it is shipping weekly, and inquiries increasing. A manufacturer of upright drills succeeded during the week in reducing delayed shipments to a point where he can approximate a six or seven months' delivery on current orders booked. On the shipping floor at this plant stood machines crated for foreign travel labeled to parties in Berlin, Rotterdam, Cologne, Brussels, London, Yokohama, Buenos Ayres and Melbourne.

Taking the entire export field for consideration, perhaps the most pronounced inquiry of the past few days comes from South America. A number of the larger Cincinnati manufacturers have in the past few years investigated this field to good advantage, and the returns are now being made apparent.

Probably two-thirds of the leading manufacturers and heads of local concerns are away on their vacations, and when rain on Saturday, August 17, prevented the annual outing scheduled for that day of the Manufacturers' Club, Chairman E. F. Hargrave set the date for the 24th or the 31st, to be definitely announced in the interim, and it is expected to be a sort of "experience" meeting also, as many of the absent ones will be home by that time.

The biennial convention of the International Union of Metal Polishers, Buffers, Platers and Brass and Silver Workers opened Monday morning, and the delegates, to the number of 350 or 400, will be in session for 10 days. The headquarters of this organization are now in Cincinnati, having been moved from New York City. A. B. Grant is the president and Charles R. Atherton the secretary and treasurer. It is said that the principal business to be transacted will cover methods for strengthening the organization by increasing the dues, raising the per capita tax and naming additional organizers.

A large local concern manufacturing shapers reports orders ready for shipment this week as follows: Five for Tokio, 3 for Sweden, 3 for Italy, 3 for England, 2 for Holland, 2 for Australia, 1 for France and 4 for Canada, of which one goes to Vancouver. This company is six months behind in deliveries.

Bids were opened to-day in the offices of Jarvis Hunt, in the Monadnock Building, Chicago, for an equipment of about 800-hp. of boilers and engines and other machinery for the plant of the Merchants' Ice & Cold Storage Company, Freeman, Barr and Kenyon streets, Cincinnati. F. J. Dorger is president; Joseph B. Verkamp, vice-president, and Edward J. Babbitt, treasurer. The company expects to be ready for business by next spring.

The Fox Paper Company, Lockland, Ohio, has just closed a deal for an additional strip of ground, 100 x 200 ft., on which will be erected additional buildings, but as yet no plans are prepared and nothing definite has been decided upon.

Plans will be ready in the office of Harry Hake, architect, Andrews Building, Cincinnati, in about two weeks for the various divisions of work on the new office building which the Provident Savings Bank & Trust Company will erect at the corner of Seventh and Vine streets, this city.

The Bullock Electric Mfg. Company, Cincinnati, a subsidiary of the Allis-Chalmers Company, is preparing to install four or five new boring machines, foundations for which have just been completed. The plant is full of orders, enough heavy work being on hand to keep it engaged up to January 1. The foreign business is now running about 15 per cent. of the entire output, ranging in type from 500 to 6500 kw.

Government Purchases.

WASHINGTON, D. C., August 20, 1907.

The Bureau of Supplies and Accounts, Washington will open bids September 3, 10 and 17, for a miscellaneous list of material, including the construction of an electric transmission power circuit from the lighthouse station on St. Augustine and South Beach Railway to the United States wireless telegraph station on Anastasia Island. The requirements also include the following machinery equipment:

Schedule 243: One bolt cutter, one steel pressure blower, one set hand plate bending rolls, one radial drill, one sensitive drill, one blacksmith's drill, one blast forge, one drill grinder, engine lathes, patternmaker's lathe, drill press; Schedule 244: Motor driven planer, belt driven shaper, adjustable saw table; Schedule 245: steam windlass.

The Isthmian Canal Commission will shortly issue a call for bids under Circular 387, for one portable long reach pneumatic riveter for light riveting work.

The Isthmian Canal Commission is preparing to ask for bids for one pneumatic geared hoist having a capacity of 20,000 lb.

Proposals will be received by the Bureau of Supplies and Accounts, Navy Department, on August 27, for a quantity of naval supplies, including, under schedule 165, band saws, saw bench, planer and jointer.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until August 27 for the following machine tools: Schedule 212, one drilling machine; Schedule 166, pipe cutting and threading machine, turbo generator; Schedule 213, motors; Schedule 214, milling attachment, emery wheels, pneumatic drills and hammers; Schedule 209, two grinders, condenser; Schedule 164, traveling crane; Schedule 165, rotary shear, band saw machine; Schedule 215, motor drive; Schedule 204, pressure blower, forges, oil pumping apparatus.

The Bureau of Yards and Docks, Navy Department, Washington, will receive bids until September 14 for furnishing 15 motor generator sets and accessories for the New York Navy Yard.

The custodian's office of the United States Postoffice and Court House, San Francisco, Cal., will receive sealed proposals until 12 o'clock noon, August 29, for motors, rheostats, chain drivers, air compressor, circuit breakers, conduit, wire, &c.

The New Gilbert Brass Foundry.

The A. Gilbert & Sons Brass Foundry Company, now at 2024 Eugenia street, St. Louis, in order to keep pace with the demand for its products, has purchased a site of 75 x 180 ft. for a new plant on Forest Park boulevard, between Vandeventer and Sarah streets. The building will be mainly one story, having a two-story front, of which the second story is intended for offices. The structure will have a saw tooth roof, with 18,000 sq. ft. of skylight, supported on steel trusses, so as to leave the interior clear of columns. The new plant will cost about $25,000, and the company hopes to make it the best equipped brass foundry and white metal factory in the West. Every approved arrangement will be adopted for the comfort of the employees, including private lockers and shower baths.

The company started in business in 1899, and the building now under construction is the fourth expansion made in the eight years of its existence. Each time the output has been more than doubled. At present from 9 to 10 tons of brass and bronze castings and 10 to 15 tons of solder, babbitt and antifriction metals are turned out daily. Jovian babbitt metal and Velox bronze are the two principal brands. The Jovian babbitt is manufactured specially for fast running machinery, such as dynamos, locomotives and woodworking machinery, and will stand great crushing strain. The Velox bronze is used extensively for locomotive driving journals and connecting rods, axle bearings and street railroad armatures. About 10 different grades of babbitt and antifrictional metals for all purposes are manufactured, as well as solder, ingot metals and aluminum castings. The new building is to be rushed to completion, and the company expects to occupy it by October 1. Charles F. Gilbert is president of the company.

On Thursday, August 15, the Bessemer steel plant of the Youngstown Sheet & Tube Company, Youngstown, Ohio, turned out 1666 gross tons of ingots in two turns of 12 hr. each. The company recently started another cupola, now having four in operation.

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HARDWARE

IT was, of course, to be expected that the parcels post question would be reopened at the coming session of Congress. The advocates of such an extension of Government assistance to their business have too much to gain to discontinue their efforts to persuade members of Congress that the establishment of a parcels post is one of the most crying needs of the time. In no other direction do those who are building up or conducting a mail order trade see such possibilities of almost limitless expansion as would be enjoyed if the United States Government assumed the larger part of the cost of delivering their merchandise to buyers in every section of the country. At a postage stamp rate for the entire Union no place would be too remote to be reached by the solicitor of mail order business, whose sphere of influence is now quite restricted if his merchandise weighs over a few ounces.

That the matter will positively again be up for consideration has now been assured by the deliverances of the new Postmaster General, George Von L. Meyer, who was transferred to that position from the post of Ambassador to Russia. In a recent speech at a public gathering, as well as in interviews with representatives of the daily press, he names the establishment of a parcels post service as part of a programme of suggested changes in the administration of his department which he shall recommend to Congress. This oft defeated project promises, therefore, to make a better start in its next winter's campaign than has been its experience for some years. Official acquiescence counts for much in any measure coming before Congress; official indorsement goes still further; but official initiative is naturally the most vigorous and effective. In this case not only has the Postmaster General announced his intention to press the parcels post question upon the attention of Congress, but it may almost be assumed that he will have the assistance of the President, as the full programme of proposed postal changes was made public immediately after an extended conference with the Chief Executive.

The prospect may well cause uneasiness among the retail merchants whose trade is now being injured by mail order houses. The ample notice given, however, should enable comprehensive work to be done in offsetting the renewed strength imparted to the parcels post agitation by this declaration of official assumption of the work of pressing for its adoption. Retail trade interests successfully combated a similar condition of affairs some years since, when Postmaster General John Wanamaker brought to bear all the influences he could command in the effort to graft upon our postal service this European idea. At that time retail merchants were not nearly so well organized as they now are, not only in the Hardware trade, but in many other branches of mercantile business. The officers of retailers' associations will doubtless bestir themselves at once in devising a method of procedure to convince Senators and Representatives in Congress that the proposed enlargement of the postal service would be seriously detrimental to the interests of many of their worthy constituents. As the business of jobbers depends upon the welfare of retailers, the organizations in the wholesale trade will hardly overlook the apparent need of their taking an active part in this new campaign. In addition to these important trade factors are the organizations of manufacturers, whose outlet for their products is mainly or entirely through jobbers and retailers. Their managers can hardly look on with indifference while a question of such vital interest to them is up for action. Individual effort will unquestionably vigorously supplement the work of trade associations. It will be very remarkable if a measure which has so often been beaten can now be adopted, when the influences in opposition are far stronger than ever before.

Condition of Trade.

Developments are still lacking of importance sufficient to give character to the Hardware market. While the advancing tendency so long observed has been effectually checked, prices remain remarkably firm, in the face of the diminished buying by large distributers, to which attention has already been called in these columns. Only here and there are slight concessions reported on the part of manufacturers and jobbers, occasioned in the case of the former by a desire to have plenty of business ahead, and as to the latter, by a disposition to reduce their stocks. Nearly all manufacturers whose brands are well established on the market and who are recognized as leaders in the lines which they produce are still well supplied with orders and holding their prices as firmly as ever. We are probably at the hight of the summer dullness and the relaxation incident to the vacation season, features which are admittedly much more marked than a year ago, but another week or two will doubtless witness a distinct revival of activity accompanying the opening of the fall trade. The virtual deadlock between buyers and sellers of Copper and Copper products continues, but there are indications that the reactionary movement has pretty nearly run its course, and that developments calculated to clear the situation may be expected in the near future. It is an occasion of some surprise, not to say congratulation, that the semidemoralization which has recently visited our securities markets and the failure of a large industrial concern have had so little apparent effect on mercantile affairs. Monetary conditions continue stringent and collections slow.

NOTES ON PRICES.

Wire Nails.—The demand is nearly equal to the output of the mills, although Steel is in better supply. New business and specifications on contract orders are keeping the mills fully employed. Cars are being furnished by railroads with more promptness, yet there is little improvement in deliveries. Contracts are being placed for future delivery in good volume. The market is firm. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers	$2.00
Carload lots, to retail merchants	2.05

New York.—A good demand, considering the season, is experienced by local jobbers, who have difficulty in receiving prompt shipments from mills. The local market is generally maintained, except that sometimes Hardware jobbers sell Nails at less than regular quotations. New York jobbers' quotations are: To retailers, carloads, on dock, $2.19; less than carloads, on dock, $2.33; small lots at store, $2.30.

Chicago.—Considering the lateness of the season, the demand is remarkably heavy. From the fact that, though the mills are running at full capacity, no improvement

in deliveries is being made, it is evident that incoming business at least equals the output. Contract bookings for the forward season are fully up to expectations. Quotations are as follows: $2.18 in car lots to jobbers and $2.23 in car lots to retailers, with an advance of 5 cents for less than car lots from mills.

Pittsburgh.—The demand for Wire Nails continues unusually active for this season of the year, and this with specifications on contracts, which continue to come in freely, keeps the mills fully employed, output and shipments being heavy. The supply of Steel is better than for some time, and there is little complaint from Wire Nail mills on this score. This is also true of cars, which are being furnished promptly by the railroads, these conditions allowing the Wire Nail mills gradually to catch up on back orders. The market is firm, but prices are unchanged, although it is claimed that some of the smaller Wire Nail mills are able to get premiums for prompt shipments. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers	$2.00
Carload lots, to retail merchants	2.05

Cut Nails.—The larger quantity of available Steel and more liberal supply of cars are tending to more prompt shipments from mill. Jobbers who bought Nails at lower than present prices are in a position to sell at less than regular quotations. Mills are reported as generally maintaining the recent advance in prices. Quotations are as follows, f.o.b. Pittsburgh: Carload lots, to jobbers, $2.10; less than carloads, to jobbers, $2.15; less than carloads, to retailers, $2.25. Iron Cut Nails at points west of and including Buffalo and Pittsburgh are held at 10 cents advance on Steel Cut Nails.

New York.—The demand is in about the usual proportion to that of Wire Nails, both being moderate at this season. Prices are generally maintained, except as Hardware jobbers sometimes cut prices. New York jobbers' quotations are on the basis of $2.30 for small lots at store.

Chicago.—Locally the demand is a little quieter than for some weeks. Jobbers are, however, this week asking the advance named in the new schedule. Shipments from mill are somewhat tardy, but stocks are ample to supply the demand. Quotations are as follows: Iron Cut Nails, car lots, to jobbers, $2.38; to retailers, $2.43; Steel, to jobbers, in car lots, $2.28; to retailers, $2.33.

Pittsburgh.—The scarcity in supply of Cut Nails is being relieved by the fact that Steel is being furnished more promptly, and cars are also in better supply, so that the Cut Nail mills are gradually catching up on deferred shipments. Some of the jobbers have fairly large stocks of Cut Nails, bought when the prices were lower than they are now, and for this reason there is some cutting in prices. The mills are reported to be adhering to the prices on Cut Nails adopted July 31, which are as follows, f.o.b. Pittsburgh: Carload lots, to jobbers, $2.10; less than carloads, to jobbers, $2.15; less than carloads, to retailers, $2.25. Iron Cut Nails at points west of and including Buffalo and Pittsburgh are held at 10 cents advance on Steel Cut Nails.

Barb Wire.—Mills are still working on old contracts, on which specifications are being received freely. New business is light, but in excess of what is expected at this season. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots	$2.15	$2.45
Retailers, carload lots	2.20	2.50
Retailers, less than carload lots	2.30	2.60

Chicago.—Besides the shipments of specifications on contract, which are unusually heavy for the time of year, there are also some new orders of considerable size coming in. A recent one for 16,000 spools is noted. We quote as follows: Jobbers, Chicago, car lots, Painted, $2.33; Galvanized, $2.63; to retailers, car lots, Painted, $2.38; Galvanized, $2.68; retailers, less than car lots, Painted, $2.50; Galvanized, $2.80; Staples, Bright, in car lots, $2.30; Galvanized, $2.60; car lots, to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

Pittsburgh.—Shipments by the mills continue unusually heavy for the season, this being due to the fact that they have not yet filled old contracts, on which buyers are specifying freely. New demand is light, but is larger than usual at this season of the year. It is understood that the tonnage of Barb Wire sold this year by the mills will break all previous records. Prices are firm but unchanged. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots	$2.15	$2.45
Retailers, carload lots	2.20	2.50
Retailers, less than carload lots	2.30	2.60

Smooth Fence Wire.—Mills are working to their full capacity to supply the demand. This is made up of specifications on old contracts and a heavy volume of new business. Prices are firm. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads	$1.85
Retailers, carloads	1.90

The foregoing prices are for base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

	6 to 9	10	11	12&12½	13	14	15	16
Annealed	Base.	$0.05	.10	.15	.25	.35	.45	.55
Galvanized	$0.30	.35	.40	.45	.55	.65	1.05	1.15

Chicago.—Between the specifications on old contracts and new contracts for fall shipment being booked, the mills are taxed to their fullest capacity to supply the demand. Makers of Fencing all over the country are crowding for deliveries. Quotations are as follows: In car lots, to jobbers, $2.03 f.o.b. Chicago, and to retailers, $2.10.

Pittsburgh.—We note a heavy volume of new business on Fence Wire, manufacturers sending in large orders for forward delivery, while specifications on old contracts are coming in freely. The Wire mills are now receiving a plentiful supply of Steel and also of cars, and are gradually catching up on delayed orders. Prices are firm but unchanged. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads	$1.85
Retailers, carloads	1.90

The foregoing prices are for base numbers, 6 to 9.

Sheet Zinc.—The price of Sheet Zinc has again been reduced, and the present base is $7.75. Under date of August 5 the manufacturers made changes in Sheet Zinc Extras, as shown in the accompanying list. These changes are in the nature of increases, as follows:

Base Sizes { Thickness, Nos. 9 to 19, inclusive. Widths, 32 to 58 inches, inclusive. Lengths, 72 to 96 inches, inclusive.

Extras in cents per 100 pounds advance over base price.

Nos.		5	6	7	8	9 to 20
32 to 40	x 84	50	25	15	10	----
24	x 84	80	25	15	10	----
26	x 84	95	25	15	10	----
28	x 84	90	75	50	35	----
30	x 84	80	65	45	30	----
48	x 84	80	25	15	10	----
50	x 84	85	25	15	10	----
52	x 84	95	25	15	10	----
60	x 84	175	80	45	35	20
36	x 96	70	30	20	10	----
48	x 96	105	65	20	10	----
36	x 108	65	45	30	20	----
48	x 108	130	75	40	35	25
62	x 84	extra given on application.				
64	x 84					

The extra on No. 4, 36 x 84, is $1.20 per hundred pounds.
The extra on No. 3, 36 x 84, is $2.80 per hundred pounds.

Bolts and Nuts.—The monthly conference of manufacturers of Bolts, Nuts, &c., is being held this week in this city. Report has it that prevailing prices have been reaffirmed. As already hinted in these columns, the market is not especially firm, as manufacturers who are catching up with their orders, show a willingness to make concessions on desirable business. Some uneasiness is apparent on the part of a few makers of Bolts regarding a possible decline in raw material.

Sheet Metal Products.—Premiums on Sheets have practically disappeared, so that the market presents a

somewhat easier appearance. At the same time, prices on finished products are said to be well maintained and business is in good volume for this season of the year. The demand for Galvanized Ware is referred to as unusually large. Manufacturers state that the reaction in Tin will have to go considerably farther before it will be reflected in quotations on Tinware.

Sash Cord.—Another Sash Cord meeting has passed without bringing forth the advance long prophesied in some quarters. The suggestion is offered that higher prices for Cord would tend to reduce consumption and encourage the use of Chain. The market is quiet, many buyers showing a disinclination to purchase liberally at present prices.

Carriage and Wagon Springs, Seat Springs etc.—The market for Carriage and Wagon Springs, Seat Springs, etc., seems to be in excellent condition. Prices show a marked steadiness and tendency to uniformity according to quantity. A heavy demand is reported.

Rubber Belting, etc.—Crude Rubber is slightly lower, fine Para showing a decline of upwards of 5 cents per pound. Cotton duck, however, is higher as are other items entering into the manufacture of Mechanical Rubber Goods so that prices on these lines hold decidedly firm. While there is some lessening of consumption from the lumber industry, demand in general is said to show no let-up and with some manufacturers is even heavier than a year ago.

Rope.—The demand keeps up in a comparatively small way, orders usually being for smaller lots than are expected at this season. Consumers of Manila Fiber are not buying on account of the uncertainty of the market, prices being from 1⅛ to 1¼ cent. less per pound than for the corresponding time in 1906. It is stated that over 130,000 more bales of Manila Fiber have been received in the United States than for the same period in 1906. The lack of demand and low price of Manila Fiber are causing large buyers of Rope to purchase conservatively instead of car lots, thus pursuing a hand to mouth policy. Quotations are as follows: Pure Manila, 12½ to 12¾ cents; B quality, 11½ to 11¾ cents. Pure Sisal, 9 cents, lower grades Sisal, 7¾ to 8 cents; No. 1 Jute, ¼ in. and up, 9 cents; No. 2 Jute, 8½ cents.

Window Glass.—The meeting of committees of manufacturers and workers scheduled for last week did not take place. About two-thirds of the present month has gone and a very small percentage of manufacturers have even started to make repairs. It requires at least a month to heat the tanks and get new Glass on the market after it has been decided to resume operations. It now looks as if no large quantity of Glass could be put on the market under six or eight weeks, even if repairs were begun at once. The question of wages, however, has to be decided before manufacturers will commence making repairs. Manufacturers as a rule have stiffened up their prices in view of a later start. Local demand is very quiet and prices are reported as ranging, according to the anxiety of the seller, from 90 and 10 to 90 and 15 per cent. discount on single; and from 90 and 10 to 90 and 20 per cent. discount on double strength Glass. This is from the jobbers' list, October 1, 1903. Western jobbers' discounts are reported as being 90 and 10 per cent. discount for the first three brackets of single thick; 90 and 15 per cent. for other brackets of single thick and 90 and 20 per cent. discount for all sizes of double thick, from the same list.

Linseed Oil.—The movement in Oil is confined to small jobbing lots and shipments on contract orders to large handlers. It is reported that car lot orders for September and October deliveries can be placed at 38 cents for State and Western Raw. If a full crop of undamaged Seed is harvested the outlook will be for lower prices. New York quotations for Oil, according to quantity, are as follows: City Raw, 43 to 44 cents per gallon; Out of Town Raw, 40 to 41 cents per gallon; Boiled Oil is 1 cent a gallon over Raw.

Spirits Turpentine.—Lack of buying and weakness have been features of the local market during the week. Prices have been on the basis of 59½ to 60 cents, according to quantity, for Machine Made Barrels until Tuesday, when prices advanced ½ cent per gallon owing to light holdings. New York quotations are as follows, according to quantity: Oil Barrels, 59½ to 60 cents; Machine Made Barrels, 60 to 60½ cents per gallon.

DEATH OF CHARLES F. FERNALD.

CHARLES F. FERNALD, one of the old guard of commercial travelers, died at his home in Brooklyn, August 19, from a third stroke of paralysis, the first of which occurred about three years ago. He was an exceptionally well qualified salesman, a man of high purpose and strong integrity, and greatly respected by both business and social acquaintances. Mr. Fernald was born in Boston a little over 70 years ago, and began his business career there. In 1867 he came to New York and became connected with Blodgett, Brown & Co., who were jobbers of Hardware in Beekman street. Afterward he went with August Pettibone, a Hardware commission merchant. Early in the 70's he established with Horace F. Sise the firm of Fernald & Sise, who had agency accounts as representatives of manufacturers. In 1873 Mr. Fernald went with J. C. McCarty & Co., and as their representative called on the trade in New York State and Western territory. In 1887 he identified himself with Alonzo E. Dietz, Brooklyn, N. Y., manufacturer of fine Locks and Latches of various kinds. Mr. Fernald was a veteran of the Twenty-third Regiment, N. Y. S. M., and is survived by a widow and one son by his first wife.

A CAREFUL study of home needs lies behind the little book entitled "The Enterprising Housekeeper," issued by the Enterprise Mfg. Company of Pennsylvania, Philadelphia, which has used successive editions as a compliment to its women customers and as an advertising medium, until over 3,000,000 copies have been distributed by mail and through the retail Hardware merchants. The sixth edition of the little volume, revised and improved, is now being distributed. It includes a lot of famous old recipes which housekeepers value because of their simplicity, economy and goodness, and also a selected collection of newer recipes, all tested and proved right. It contains in addition descriptions of the Enterprise Meat and Food Choppers, Sausage Stuffers and Lard Presses, Coffee Mills, Fruit, Wine and Jelly Presses, Sad-Irons, &c. When imprinted with the business card of the merchant this book serves to advertise his store indefinitely. Copies may be obtained by addressing the advertising department of the company.

IN editorial comments in our last issue relative to imports of lines related to Hardware, brief allusion was made to the notable increase in the purchases of foreign Wire and Wire articles in the fiscal year ending June 30, 1907, as compared with the previous 12 months, the figures being $1,330,852 and $823,931 respectively. Advancing as an explanation for this the Plymouth Mills, Plymouth, Mass., advise us that they have found it impossible to get domestic Wire in sufficient quantities to supply their requirements, which has doubtless been the experience of others. With enlarged capacity on the part of American Wire manufacturers it is not likely that this condition will continue during the next fiscal year.

THE PITTSBURGH AUTOMATIC VISE & TOOL COMPANY, Pittsburgh, is having a very large trade from the United States Government for its Pittsburgh Vises, and has appointed H. M. Kearns its special Government representative. Mr. Kearns has a large acquaintance in army and navy circles and is well qualified to fill the position to which he has been appointed.

THE FULLER HARDWARE COMPANY has been organized at Fitchburg, Mass., to conduct a Hardware and Paint business. The company has a capital stock of $15,000. William A. Fuller is the president, William T. Gavin, treasurer, and Howard B. Fuller, secretary. This is a new business, closely affiliated with the Gavin Hardware Company, in the adjoining town of Leominster.

The Trades 100 Years Ago.

Fourth Article.

The following article with the accompanying illustration is taken from the "Book of Trades, or Library of the Useful Arts," which was published in 1807 by Jacob Johnson, London, and at that time for sale in his bookstores in Philadelphia and Richmond, Va.

The Turner.

Turning is a very ingenious business, and the operation is very well represented in the plate. The principal engine made use of in this employment is the lathe, which is exceedingly useful for the turning of wood, ivory and various other materials, such as brass, iron and silver, into a round or oval shape.

This art was well known to the ancients and by them carried to a considerable degree of perfection. It is of great importance in many of the arts of life. The architect

Turner.

uses it for ornaments, both within and without highly furnished houses, and the mechanician and natural philosopher have recourse to it, not only to embellish their instruments, but to adapt them to their different uses.

There are various kinds of lathes; that represented in the plate is as useful for small work as any. Some require the aid of one or two men to turn the wheel, but in this the wheel is turned by means of the treadle by the same man that is employed in turning the wood. The thing to be turned is fixed on the lengthened axis of the smaller wheel, and upon the prop or rest the chisel or other cutting instrument is supported, and being brought to touch the wood while it is swiftly turning round it takes off shavings to the greatest nicety.

The piece to be turned should be rounded before it be put on the lathe, either with a small hatchet, such as that which stands just behind the man, or with a plane, &c., shaving it down till it is everywhere nearly of an equal thickness, leaving it a little larger than it is intended to be when finished off.

The young turner should endeavor to acquire the complete management of the gouge and chisel, which are the instruments by far the most frequently used, and the most necessary in this art. By them almost all the soft woods are turned; and, as to the hard woods, as box, ebony, ivory, &c., they are scarcely ever turned except by shaving off. In that case gravers are to be used with square, round or triangular ends. These should be held horizontally while applied to the wood; but the gouge and chisel must be used obliquely.

When the wood is completely turned it is next to be polished. Soft woods, as the pear tree, the hazel and the maple, may be polished with fish skin or Dutch rushes. Fish skin, which is the skin of the shark, is always much better after it has been used, because in its natural state it is too rough for bringing work to a proper degree of polish. The oldest plants of the Dutch rush are the best, but before they are used they must be moistened with water. When the work is finished in this way it is to be rubbed up with a little wax or olive oil. Ivory, horn, silver and brass are polished with pumice stone finely pounded and put upon leather. Different methods and different substances are made use of for this purpose by different workmen.

According to Dr. Paley, not a man in a million knows how an oval frame is turned. It may be thus made: Take two ovals of metal exactly of the size of the oval wanted; fix them firmly on the spindle of the lathe, so as to turn round with it; fix between them the wood to be turned, and then it is readily cut with chisels or other tools, as the lathe goes into exactly the figure of the external ovals.

In fixing a lathe great care should be taken that it be placed in a light situation near a window, and neither so low as to oblige the workman to stoop in order to see his work, nor so high that the chips should come in his eyes.

A journeyman in this business may earn a guinea and a half a week, and those who work on toys and smaller articles much more. The lathes used in the nicer sort of turning are very expensive, consequently the stock of a master turner is valuable; and no lad should be brought up to the trade that has not something of a mechanical genius, because there is an almost endless variety in the trinkets made for sale, as may be seen in any large retail shop window.

Ivory is much used by the turner, which is the tooth or tusk of the elephant, growing on each side of his trunk somewhat in the form of a horn. Ivory is much esteemed for its color, the fineness of its grain and its polish. That from Ceylon and Achen is the best, as it never becomes yellow. It is easily stained to any color.

THE NEAL & SCOTT COMPANY, 81 Warren street, New York, wholesale Hardware, is sending to its customers a souvenir in the form of a memorandum desk pad, 3 x 5 in. The pad case is of black morocco leather, containing blank memoranda paper, caught at the corners of the case.

THE KROHN HARDWARE COMPANY has been incorporated at Whitewater, Wis., with a capital stock of $10,000, with Gustav H. Krohn, Francis F. Shumacker and Wm. H. Kennred as incorporators.

Business Methods in a Builders' Hardware Store.*

Second Article.

In this kind of business it is particularly necessary to know the quantity of the different items in stock at all times. For this purpose a perpetual inventory is kept in a card index, covering every kind and class of goods carried, including even Pocket Cutlery, though but one or two of each item are in stock, except items in "obsolete goods," to which further reference will be made.

In Fig. 5 one of the stock cards is shown, on which

NO. 780 ARTICLE Butts 4 x 4 B.Z.10 MAX 30 MIN. 10

DATE 1906	STOCK	REC'D	SOLD	ON HAND	DATE 1906	REC'D	SOLD	ON HAND	DATE 1906	REC'D	SOLD	ON HAND
1/1	18			18	7/29		2	11				
1/12			6	12	8/2		7	7				
1/13			1	11	15/10		7	0				
1/22			2	9	8/13	30		30				
2/5			4	5	12/2		1	29				
2/		30		35	9/7		3	26				
3/17			12	23	9/15		4	22				
3/30			7	16								
4/10			1	15								
4/17			5	10								
5/3			3	7								
13/24			1	6								
6/3			5	1								
6/7		30		31								
6/19			3	28								
6/27			5	23								
7/14			1	22								
7/24			3	19								
7/30			6	13								

Fig. 5.—Stock Card, 3 x 5 In.

the inventory is kept. The cards are buff in color, headed and ruled on both sides alike, and measure 3 x 5 in. in size. The card shown, No. 780, is devoted entirely to 4 x 4 Butts, B.Z.10 being the finish symbol. "Max." and "min." relate to the maximum and minimum number of pairs of Butts of this finish ordered and to be kept in stock, and serve as guides when ordering goods.

$5000.00

NAME A. A. Scofield

ADDRESS 323 Strawmer St Stamford, Conn. 1906

DATE 1906		ITEMS	DEBIT	CREDIT	ITEM	DATE 1906
Nov.	3	6 pr 780 Butts 4x4 B210	12 00			
	7	3 " N323 Distinct Sets	8 50			
	15	12 pr 2412D2 Butts 3½ x 3½	2 40			
	23	12 " N321 Sets SC217	7 20			
			23 10	23 10	Check	Dec 8
Dec.	11	1 dz 5223 Coat Hooks	12			
	"	1 " N321 Sets SB210	60			
	"	1 pr 2412D2 Butts 3½ x 3½	18			
	12	1 gro 1½ #9 FH Brass	20			

Fig. 6.—Ledger Card, 4 x 6 In.

ARTICLE Sash Fasts, plain iron, unpolished, antique Copper.

Date 1906	List No	List Price	Discount	Freight	Net Cost	Purchased From
4/2	300B	$4.25 dz	75-25	Yes	85¢ dz	Champion
7/3	839	1.40 "	40-20	No	76 "	Jacks
9/2	023	5.00 "	75-25-10	"	85 "	Field
11/16	7110	1.70 "	45-10	"	84 "	R T E.

Fig. 7.—Cost Card, 4 x 6 In.

The maximum, the quantity of goods always ordered, is supposed to be a three months' stock, while the minimum is regarded as a one month's stock.

Checking Up Stock.

The previous day's sales are checked up each morning, using both cash and charge sales tickets, by one of the young women in the store, which requires 1 to 1½ hr. at an expense of about 15 cents, the items on the sales tickets being deducted from the stock cards. It will be seen from Fig. 5 that on January 1 there were 18 pairs of these Butts in stock, that six pairs were sold on the 12th, one pair on the 13th and two pairs on the 22d. This reduced the stock below the minimum and the quantity left, nine pairs, was consequently checked.

The proprietor keeps on his desk blank sheets headed with the names of the various concerns from whom goods are bought and on the appropriate sheet the clerk marks "30 pairs Butts, 4 x 4, B.Z.10." Goods for stock are usually ordered from these sheets once a week, but before they are ordered the minimum amount on the cards is verified by looking up the stock. When stock cards are filled on both sides they are filed away and kept one year for reference, which is necessary, especially if the goods are active.

Comparing Inventories.

In January, 1905, an account of stock was taken in the usual manner to determine how nearly correct the stock cards were. The quantity of stock on hand, as shown by the cards and by the inventory, so nearly agreed that the stock cards are now used exclusively as the basis for taking inventory.

Obsolete Stock.

There is seldom a building in which the plans are not changed in some particular; a door or window omitted, for instance, or other changes made which leave some of the Hardware that has been especially ordered for this particular job on the contractor's or owner's hands. As such articles are of no use to either the contractor or owner, they usually wish to return them, and the firm takes back such articles giving credit at 10 per cent. below the manufacturer's price. These obsolete or special goods, articles not regularly carried in stock, are not entered on the stock cards, but are kept on certain shelves by themselves. Regular customers buy from this collection of goods from preference, as they are sold at a small advance above cost. By exercising care the obsolete stock is kept down to about $25 worth at all times.

Ledger Cards.

All accounts are kept on white ledger cards, shown in Fig. 6. These have headings and ruling on both sides, printed in red and are 4 x 6 in. in size. Open accounts are kept in the front part of the containing tray and closed accounts at the rear. The charge sales tickets are assorted from the cash sales tickets each morning, and entries of the items charged are made on the legder cards. This reduces bookkeeping to a minimum.

Amount of Credit Extended.

In the right hand upper corner of each ledger card is placed the amount of credit the customer is entitled to, and his account is never allowed to exceed his credit. The amount of credit to which a new customer is entitled is decided by first looking up his rating in one of the commercial agency books. If then there is any doubt as to his responsibility three references are required, one being a bank. If necessary the salesmen on the road can usually obtain additional information from lumber companies or other sources. No goods are delivered until the customer's credit is fully established. This has resulted in an exceedingly small percentage of loss from bad accounts during the three years of business.

* This series of articles, begun in our last issue, relates to the business system adopted in the store of Robert A. Reynolds & Son, Stamford, Conn.

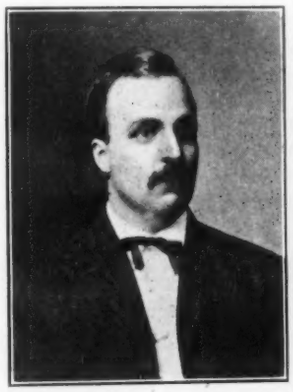
Keeping Track of Costs.

In Fig. 7 is shown one of the cards on which cost of goods is kept. The cards are white, 4 x 6 in. in size and have printed headings and rulings on both sides. The card illustrated relates to plain iron, unpolished Antique Copper Sash Fasts. The information given by the cards covers date of purchase, list number, list price, discount, freight, net cost and from whom purchased. The quantity of goods purchased is entered on a stock card devoted to these goods, under the heading "Rec'd," when they arrive.

(To be continued.)

TENNESSEE RETAIL HARDWARE ASSOCIATION.

AS the result of a meeting held at the Tulane Hotel, Nashville, on the 5th inst., the Tennessee Retail Hardware Association was formed. W. S. Hemby, editor of the *Memphis Journal of Commerce*, who had much to do with bringing about the conference, called the assembled merchants to order, those present representing the following firms:



L. D. LOVE,
President.

M. RICHARDSON,
Secretary.

Mitchell Ashley Hardware Co., Columbia.
H. A. Hutton & Co., Gallatin.
Collins Hardware Co., Winchester.
Newbern Hardware Co., Newbern.
Bennett & Campbell, Franklin.
H. M. Freeman & Co., Lebanon.
T. D. Ford & Co., Cookeville.
Smith, Tosh & Co., Manchester.
Jarratt & Love, Nashville.
Buchanan Bros., Lawrenceburg.
Woosely & Evans, Shelbyville.
Beaver Bros., Jellico.
Brasfield & Brasfield, Dresden.
Ewing Bros., Gallatin.
Churchwell & Son, Savannah.
W. P. Street & Co., Columbia.
Clayton Hardware Co., Lewisburg.
McClung, Buffat & Buckwell, Nashville.
Grant-Hanson Hardware Co., Morristown.
M. Richardson & Co., Lawrenceburg.

L. D. Love, Jarratt & Love, Nashville, was chosen temporary chairman, and M. Richardson, M. Richardson & Co., Lawrenceburg, secretary.

R. M. Dudley, president of the Gray & Dudley Hardware Company, Nashville, was introduced, and heartily welcomed the visitors to the city and wished the merchants success in their efforts to form a useful and helpful association.

Secretary M. L. Corey, who was present as the representative of the National Retail Hardware Association, read an interesting letter from National President S. R. Miles, in which he warmly approved the object for which the merchants had come together. Mr. Corey then made an address on the subject of retail hardware organization and the benefits secured through it, which was listened to with close attention.

Committees on permanent organization, constitution and by-laws and resolutions were then appointed by the chair, after which the meeting adjourned to permit those present to enjoy the hospitality of the Gray & Dudley Hardware Company, who entertained them at an excellent luncheon.

On reassembling in the afternoon the following officers were chosen to lead the association during the first year of its existence:

PRESIDENT, L. D. LOVE, Nashville.
FIRST VICE-PRESIDENT, M. A. Walker, Covington.
SECOND VICE-PRESIDENT, J. R. Fischesser, Spring City.
SECRETARY and TREASURER, M. Richardson, Lawrenceburg.
EXECUTIVE COMMITTEE: Messrs. Love, Walker, Fischesser, and W. A. Hutton, Gallatin, and E. L. Collins, Winchester.

A number of resolutions of thanks were adopted, together with one in opposition to the establishment of a parcels post by the Government, and urging one cent letter postage. It was unanimously voted that the body affiliate with the National Retail Hardware Association.

HUBBARD & CO.

HUBBARD & CO., Pittsburgh, manufacturers of Shovels, Spades and Scoops, Railroad Track Tools, Hammers and Sledges, Coal Miners' Tools, Bolts, Nuts and Washers, Picks, Mattocks and Grub Hoes, have decided to make some large additions to their Bolt and Pole Line Material department. A number of new buildings will be erected of brick and steel frame construction, with slate roofing and equipped with crane conveying machinery. The sizes of these buildings will be as follows: Pumping station, 30 x 28 ft.; forge shop, 87 x 87 ft.; threading shop, 57 x 87 ft.; machine shop, 32 x 75 ft.; engine room, 20 x 30 ft.; warehouse, 88 x 88 ft. Forty additional Nut and Bolt machines will be installed at once, as well as several gas engines, pumps, Rivet machines, Hot and Cold Bolt headers, Roll and Cut threaders, Nut machines, Bulldozers and Punch presses. In addition to the products now being made in the Bolt and Pole Line Material department, the manufacture of Stove Bolts, Tire Bolts, Carriage Bolts, Rivets, Track Bolts and Nuts will be taken up.

MISSISSIPPI RETAIL HARDWARE ASSOCIATION.

IN other columns we refer to the organization of retail Hardware associations in the States of Tennessee and Alabama, the former at a meeting held on the 5th inst., and the latter on the 6th inst. On the 8th inst. the Mississippi merchants got together and perfected an organization, rounding out a movement which had for its object the formation of associations in the three States named. As at the Nashville and Birmingham meetings M. L. Corey, secretary of the National Retail Hardware Association, was present at the gathering of the Mississippi merchants, which was held at the Hotel Wisteria, Winona. The following officers were elected for the first year: President, P. E. Pegues, Winona; vice-president, D. H. Hale, Aberdeen; second vice-president, Mallory Davis, Itta Bena; secretary and treasurer, John E. Sommers, Sommers Hardware Company, Clarksdale.

THE G. WHITE AXE COMPANY, Honesdale, Pa., manufacturer of Axes, Bark Spuds, etc., calls attention to the fact that since 1836, a period of over 70 years, the White Stub and Twist hand-made Axes have been on the market. The Axes of various kinds and sizes are manufactured by old-fashioned process, the best cast steel being used, and each bit inserted in the poll, giving the chopper an entire steel cutting edge back as far as the Axe can be used. About 10 years ago Geo. M. Genung and Geo. L. Meyer bought the plant and have since made many improvements and materially increased the output. The plant is well equipped with machinery, and operated by a 75-hp. turbine water wheel with a 50-hp. steam engine and boiler as auxiliary power. The company reports an excellent demand for its Axes, shipments being made to every section of the country.

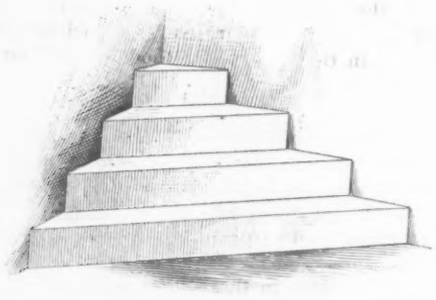
JOHN M. SHERWOOD who is well acquainted with the wholesale hardware trade of the country and who was formerly with the Caldwell Mfg. Company, Rochester, N. Y., is now sales manager of the Bridgeport Chain Company, Bridgeport, Conn.

Hardware Window Display

Twentieth Article.

SUGGESTIONS FOR THE WINDOW FLOOR.

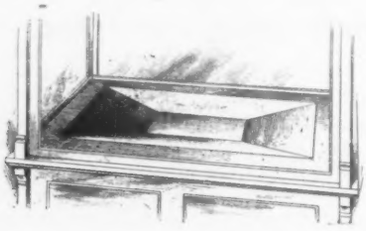
AN effective and useful piece of window furniture may be obtained by building a platform or false floor which will convert the center of the window into a kind



Stand for the Inside Corner of a Window.

of pit like an amphitheater with sloping sides. In this central space some article or articles may be prominently displayed with others, possibly smaller, but relating in character, tastefully arranged on the surrounding incline. Of course, a stand of this kind would be covered with cloth like others which have been described in this series of articles.

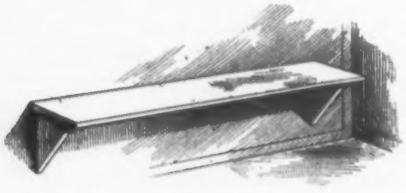
The space near the floor on the back or inside wall of a window often goes to waste, as it is usually concealed by articles in the foreground, and besides is not



Suggestion for the Floor of a Show Window.

adapted to showing goods to advantage. If, however, in this portion of the window goods can be lifted a little from the floor they may be easily seen and effectively presented. This may be accomplished by the erection of a shelf resting on brackets as shown herewith. These brackets may be constructed of strips of board with little trouble and no expense, and may be put up or taken down according to requirements. The shelf when erected should, of course, be draped or covered with plain colored material.

A platform for utilizing an inside corner of a window



Shelf for the Side Wall or Back of a Window Near the Floor.

may be made as indicated in the illustration. This, of course, can be constructed of rough lumber as in the case of other platforms which we have described, since it is concealed by a covering of cloth or some other material. A corner often presents rather a perplexing problem in window dressing and the device suggested not only affords means of filling it up, but also of using it to excellent advantage.

AMERICAN FORK & HOE COMPANY.

AT the annual meeting of the American Fork & Hoe Company, held at Cleveland on the 13th inst., F. S. Kretsinger retired from the presidency of the company and was succeeded by W. H. Cowdery, who has been first vice-president. Mr. Kretsinger has spent a lifetime in the manufacture of Farm Tools and in his advancing years he decided that he was entitled to a rest from the strenuous duties as head of the company. He did not wish, however, to give up his entire connection with the management of the company, and his name will remain among the list of its officials, a new position being created for him in an advisory capacity, with the title of chairman of the board. Mr. Kretsinger was for a long time at the head of one of the constituent companies of the American Fork & Hoe Company and has been president of the latter company for four years. He is also a past president of the American Hardware Manufacturers' Association, with whose work he will continue to be actively identified. F. L. Andrews of North Girard, Pa., who had been second vice-president, was elected first vice-president; T. H. Russell of Geneva, Ohio, formerly third vice-president, was made second vice-president, and W. C. Mason of Wallingford, Vt., was elected third vice-president. Other officers were re-elected as follows: E. D. Lowell, secretary and auditor; P. H. Withington, treasurer, and Cyrus Reimer, sales manager. The company's business during the past year has been very satisfactory, and the officers report that the prospects for the coming year are very favorable.

REQUESTS FOR CATALOGUES, Etc.

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses, with whom manufacturers may desire to communicate:

FROM M. RUBIN, 1945 Washington street, Boston, Mass., retail Hardware, Paint, Cutlery, &c., who has lately bought the building occupied by him and is fitting up the store in an up to date manner, intending to add materially to the stock formerly carried.

FROM ROHRBACHER & ALLEN, Akron, Ohio, whose entire collection of catalogues was destroyed in the recent fire. They desire printed matter, especially relating to Builders' Hardware, Factory Supplies, Tools and Hardware specialties.

FROM SHOUNS HARDWARE COMPANY, Shouns, Tenn., wholesale and retail Shelf and Heavy Hardware, Stoves, Agricultural Implements, Paints, &c.

FROM GILKEY-JARBOE HARDWARE COMPANY, Lindsay, O. T., wholesale and retail Hardware, Stoves, Agricultural Implements, Buggies, Harness, &c. The company also operates stores at Duncan and Chickasha, I. T., with headquarters at Chickasha. The Lindsay, Okla., store was opened July first.

IT has been suggested by members of the New England Hardware Dealers' Association that an associate membership be established, consisting of manufacturers, jobbers, traveling men and others who may have an affiliation with the retail Hardware trade. The idea, as it will be presented to the Executive Committee of the association, is that the associate members shall have no vote nor be entitled to attendance at executive sessions. The associate membership would be of the social order, but it is held that it would bring together the trade in its ramifications in a manner which could not be accomplished under present relations, close and friendly though these are.

THE BULLARD AUTOMATIC WRENCH COMPANY, Providence, R. I., is now under the management of Albert Roren. The new plant is running full and is being systematized with a view to increasing production.

Postmaster-General Meyer Declares for Parcels Post.

FROM OUR SPECIAL CORRESPONDENT.

WASHINGTON, D. C., August 20, 1907.

A FRANK declaration, carefully prepared in advance, to the effect that he will urge Congress at the coming session to authorize at least an experimental domestic parcels post has just been made by Postmaster-General Meyer. This official announcement cannot fail to cause great anxiety among retailers in all trades. It is fortunate, however, that the notice comes well in advance of the meeting of the new Congress, for it will afford the Hardware and other trades an opportunity for heart to heart talks with Senators and Representatives during the recess, so that when the national legislators gather in Washington next December they will be fully informed as to where the business men among their constituents stand on this important question.

General Meyer's declaration was made in the course of a speech delivered at the annual outing of the Young Men's Republican Club of Dorchester, Mass., at Nantasket Point. His address bore every evidence of careful preparation and covered a wide range, including the popularity of the present administration abroad, the political services of prominent New England public men, &c. Finally, taking up the subject of the administration of the Post Office Department, General Meyer said:

I will not propose to Congress an advance in rates on any class of mail. In fact, it is proposed to urge on Congress that the postage be reduced on books between countries with which we have direct steam communication, like England, France and Germany.

I shall also seriously consider the advisability of simplifying in every possible way the money order business—the giving of postal checks, payable to whomever the party may desire, up to $5, and postal orders payable up to 9 or 10 cents.

I am also thinking that we should consider and Congress should see fit to give the Department the right to establish a parcels post throughout the country—the weight not to exceed 5 or 10 lb.—as a trial. I hope that will be the judgment of Congress. Certainly it could be experimented on with the rural delivery.

I also would advocate increasing the efficiency wherever it is possible, by enlarging the delivery in the large commercial cities. I do not think it is feasible in any way to increase the rural delivery to more than one delivery a day, because it would double the expense in all probability and overwhelm the Government with an enormous expenditure.

General Meyer's references to a domestic parcels post, post check currency, &c., were practically ignored in the press dispatches, for the reason that in the judgment of the correspondents present they were overshadowed in importance by an elaborate speech by Senator Lodge of Massachusetts, in which, while advocating tariff revision, he declared that the Dingley schedules would not be touched by Congress before 1909. The correspondent of *The Iron Age*, however, has secured a report of General Meyer's remarks regarding postal reforms, which is presented above. New York dailies of August 15 also contained reports of an interview with him in that city, in which he expressed himself in the same manner. That his utterances will cause uneasiness among retailers of the country goes without saying, but readers of *The Iron Age* will remember that when the projects of the Postal Progress League and other allies of the big mail order houses were defeated last winter, the retailers of the country were warned that while the enemy had been beaten it had not been routed, and that preparations must be made to carry on an equally vigorous campaign in the new Congress.

General Meyer's Convictions on the Subject

of the desirability of a domestic parcels post have no doubt been absorbed during his long residence in European countries, where paternalistic governments perform many functions which in the United States are both impracticable and contrary to the spirit of our institutions. General Meyer has seen a parcels post operated in Germany and Great Britain, where the density of population is great and the length of haul a minimum, which of course is an entirely different proposition from the operation of such a service in a relatively sparsely settled country like the United States. The density of population in Great Britain, for example, is 500 to the square mile, of Germany nearly as much, and of Belgium considerably more.

The density of population in the United States is less than 25 to the square mile, but all experts agree that were such a system inaugurated its principal operation would not be in thickly settled Rhode Island nor in the neighborhood of the great cities, New York, Philadelphia, Boston, Baltimore, &c., but would be in sections where the population is widely scattered and the hauls long and unprofitable. It goes without saying that it would be possible to handle parcels over short hauls ranging from 50 to 200 miles for very moderate fees, but it is quite another proposition to take, say, 500 separate parcels, carry them to Wyoming, where the density of population is but one to the square mile, and make separate deliveries.

Government Would Lose Heavily.

It has often been pointed out that the establishment of a cheap parcels post in the United States would probably result in the express companies getting the profitable business involving short hauls, while the Government would get the long hauls at an enormous loss for the service. The express companies would be favored on the short hauls because of the additional security due to the system of receipts and guaranties employed. A well-known postal expert, in an address before the Cleveland Chamber of Commerce some months ago, asserted that a parcels post based upon the then pending Hearst and Henry bills would result in a loss to the Government ranging from $125,000,000 to $250,000,000.

A Compromise Between the Henry and Bristow Measures.

General Meyer's forecast of his recommendations to Congress will undoubtedly arouse the so-called postal "reformers" to great enthusiasm. It will especially encourage the friends of the bill introduced in the last Congress by Representative Henry of Connecticut "to secure the use of the United States rural equipment and to place the rural service on a paying basis." This bill, which should not be confounded with Mr. Henry's parcels post measure, reveals the real aims of those who advocate an "experimental" parcels post for the rural service. It provides that "within the limits of the respective rural routes served by post wagons parcels of mail matter shall be collected and delivered, house to house, by the carriers in weight up to 200 lb. and in dimension up to a barrel; no parcel, however, to be more than 6 ft. in length." The rates to be paid for this service are set forth in the bill as follows:

That the rates on parcels thus collected and delivered on the rural routes served by post wagons shall be as follows: Parcels up to 8 oz., 1 cent; parcels over 8 oz. to 1 lb., 2 cents; parcels over 1 lb. to 11 lb., 5 cents; parcels over 11 lb. to 30 lb. (half bushel), 10 cents; parcels over 30 lb. to 60 lb. (bushel), 15 cents; parcels over 60 lb. to 100 lb. (half barrel), 20 cents; parcels over 100 lb. to 200 lb. (barrel), 25 cents.

Readers of *The Iron Age* will recognize in Mr. Henry's bill, above quoted, an enlargement of the plan originally advocated by the late Fourth Assistant Postmaster-General Bristow, which was exploited early in the last Congress, but rejected by the House Post Office Committee under the very sane leadership of Representative Overstreet of Indiana. General Meyer's project appears to be a compromise between the Henry and Bristow measures, inasmuch as he proposes to limit his "experiment" to the rural routes, but to employ a 10-lb. limit of weight.

Post Check Currency Project.

It is assumed here that General Meyer's scheme for a post check currency is based upon the recommendations made to the last Congress by First Assistant Postmaster-

General Hitchcock, who is now commonly regarded as the executive head of the department. It will be remembered that Mr. Hitchcock was the chairman of a commission which examined into this subject, incidentally investigating the postal currency system of Canada. Two favorable reports on the project were made to the House and the draft of a bill was presented to both House and Senate committees. The only advocates of the legislation, aside from the Government officials, who appeared before the committees, however, were the paid attorneys of C. W. Post, the Battle Creek, Mich., breakfast food manufacturer, who was forced to admit that he had for several years personally paid the expenses of the post check currency propaganda and had manufactured more or less public sentiment through the medium of "Washington news," gratuitously supplied to such newspapers as were willing to accept the service.

Retailers Must Bestir Themselves.

The task of the hardware retailers and of all other merchants throughout the country, in view of General Meyer's announced policy, is an obvious one. The Post Office Department, aided possibly by the influence of the White House, will seek to force Congress to authorize an experimental parcels post. Retailers, mindful of the expansion of the rural free delivery "experiment" from an appropriation of $10,000 to a budget of more than $30,000,000 in a few short years, will have to convince the new Congress that the post office is wrong or in the near future they will be obliged to meet the competition of the catalogue house operating a Government subsidized delivery department in the guise of a domestic parcels post.

W. L. C.

ALABAMA MERCHANTS ORGANIZE.

A MEETING of Alabama Hardware merchants was held at the Florence Hotel, Birmingham, on the 6th inst., at which the Alabama Retail Hardware Association was organized. The gathering was called to order by W. S. Hemby, editor of the Memphis *Journal of Commerce*, who was active in bringing about the meeting, as well as that at which the Tennessee Association was formed, as referred to in another column. B. F. Luttrell of the Florala Hardware Company, Florala, was chosen temporary chairman, and L. G. Smith, Smith Hardware Company, Ensley, temporary secretary. The object of the meeting was explained by the chairman, after which the following committees were appointed, to report at the afternoon session:

NOMINATIONS: H. O. Dowling, Ozark; C. A. Simpson, Troy; J. B. Morton, Bessemer; J. W. Beasley, Birmingham; W. L. Pratt, Centreville.

CONSTITUTION AND BY-LAWS: J. U. Cureton, Dothan; F. E. Butcher, Ensley; M. Dowling, Ozark; Rane McMillen, Demopolis; L. B. Braswell, Demopolis.

RESOLUTIONS: J. W. Baker, Albertville; W. M. Ross, Albertville; J. F. Johnston, Troy; J. R. Gamble, Wetumpka; C. B. Alverson, Pell City; Frank M. Meigs, Thomaston.

M. L. Corey, secretary National Retail Hardware Association, was present and made an address, in which he pointed out the benefits of organization. A letter of encouragement was read from S. R. Miles, Mason City, Iowa, national president.

In the afternoon the Committee on Nominations reported the following list of officers, who were elected by acclamation:

PRESIDENT, B. F. Luttrell, Florala.
FIRST VICE-PRESIDENT, J. W. Beasley, Birmingham.
SECOND VICE-PRESIDENT, Rane McMillen, Demopolis.
SECRETARY-TREASURER, L. G. Smith, Ensley.
EXECUTIVE COMMITTEE: J. U. Cureton, Dothan; W. M. Ross, Albertville.

The committee appointed for that purpose reported a constitution and by-laws, which were adopted.

Resolutions were adopted thanking Messrs. Corey and Hemby for their co-operation in the work of organization, and putting the association on record as opposed to the passage of a parcels post bill and post check currency.

Following is a list of those present at the meeting, who constitute the membership of the association at the present time:

Rane McMillen, De Loach-McMillen Hardware Company, Demopolis.
J. B. Morton, Morton Hardware Company, Bessemer.
F. E. Butcher, Byrum & Butcher Hardware Company, Ensley.
C. B. Alverson, Pell City Hardware Company, Pell City.
L. B. Braswell, Braswell Hardware Company, Demopolis.
Frank M. Meigs, Foster-Meigs Hardware Company, Thomaston.
W. L. Pratt, Centreville Hardware Company, Centreville.
J. R. Gamble, Gamble Hardware Company, Wetumpka.
J. F. Johnston, T. K. Brantley & Sons, Troy.
C. A. Simpson, C. A. Simpson & Co., Troy.
James W. Baker, Albertville Hardware Company, Albertville.
H. O. Dowling, G. P. Dowling Hardware Company, Ozark.
M. Dowling, Byrd & Dowling, Ozark.
J. U. Cureton, Dothan Hardware Company, Dothan.
W. M. Ross, Ross Hardware & Implement Company, Albertville.
L. G. Smith, Smith Hardware Company, Ensley.
J. W. Beasley, S. Spiro, Birmingham.
B. F. Luttrell, Florala Hardware Company, Florala.

It was decided that the next meeting should be held at Montgomery. Mr. Smith, secretary of the association, will be pleased to respond to any inquiries from merchants in the State desiring to affiliate with the new organization.

PRICE-LISTS, CIRCULARS, Etc.

Manufacturers in Hardware and related lines are requested to send us copies of catalogues, price-lists, &c., for our Catalogue Department in New York; and at the same time to call attention to any new goods or additions to their lines, of which appropriate mention will be made, besides the brief reference to the catalogue or price-list in this column.

REPUBLIC STAMPING & ENAMELING COMPANY, Canton, Ohio: Illustrated catalogue and price-list of Old English Gray Ware, with tabulated cubic measurements of cases for foreign shipment.

S. M. HOWES COMPANY, Boston, Mass.: Catalogue illustrating and listing an extensive line of Fire Place Goods, made of brass, wrought iron and cast iron; also Brass Candlesticks and Door Knockers.

BELDING-HALL MFG. COMPANY, Chicago: Catalogue illustrated in colors, accompanied by price-list of New Perfection, Mosaic and Crystallized Enameled Stoveboards.

RALPH BROWN COMPANY, San Francisco, Cal.: Large illustrated circular addressed to merchants only and referring to Guns, Sportman's Clothing, &c., Pocket Cutlery, Hunting Knives, Razors and Carving Sets. The circular is a companion to that devoted to Fishing Tackle, which was issued by the company last spring and was well received by its customers.

NATIONAL CUTLERY COMPANY, Philadelphia, Pa.: Illustrated catalogue, with accompanying discount sheet, of Scissors, Shears, Snips, &c.

WESTERN CLOCK MFG. COMPANY, La Salle, Ill.: Handsome catalogue of Clocks, Watches, &c., illustrated by large, full page plates, showing designs, movements, escapements, &c.

KNAPP & SPENCER COMPANY, Sioux City, Iowa: Budget of pages for insertion in the company's loose leaf catalogue, referring to a variety of Hardware lines.

OLD DOMINION IRON & NAIL WORKS COMPANY, Richmond, Va.: Catalogue devoted to Old Dominion Horse and Mule Shoes.

JOHN BRIGGS has withdrawn from the firm of John Briggs & Co., Boston, and has organized under Massachusetts laws the new concern of John Briggs & Co., Inc., with office and factory at 43 and 45 Purchase street, Boston. The new company has a capital of $100,000 and the following officers: John Briggs, president; James E. Maroney, treasurer, and Geo. J. Beake, secretary. Messrs. Maroney and Beake were also associated with John Briggs & Co., the former as salesman for eight years and the latter as confidential clerk for several years. Mr. Briggs' father began the Paint, Putty and Lead manufacturing business in Boston in 1842, and he himself has been identified with the manufacturing end of the business for 28 years. A six-story factory recently acquired at the above address is being equipped with modern machinery, operated by electricity, with factory, shipping department and office all under one roof.

Michigan Retail Hardware Association.

UNITY of purpose in co-operative effort and enthusiastic support of measures designed to promote the interests of its membership formed the keynote of the thirteenth annual convention of the Michigan Retail Hardware Association, which met in Detroit at the Cadillac Hotel, August 13, 14 and 15. Success in the attainment of desired results is always a vigorous incentive to higher aims and further effort, and, backed, as it is, by a history replete with records of achievement, it is not surprising to find the Michigan Association in the forefront of progress and constantly extending the scope and power of its influence. Under the efficient management that has characterized the control of affairs in the Michigan body, much has been accomplished in the past 12 months. Among the tangible results reported is the addition of 91 new names to the roll of membership, which, with 35 accessions received during the convention, makes a total of nearly 700 members.

Nearly 500 Members Present.

In point of attendance this convention surpassed all former records, there being nearly 500 members present, and in other respects the results were equally gratifying. The business sessions, held in the afternoon of each day only, were well attended, in spite of the many seasonable attractions that temptingly invited to outside recreation. Zest was lent to the proceedings by the presence of representatives from the National Association and from neighboring State associations, whose addresses upon pertinent topics were of timely interest.

C. M. ALDEN,
President.

As in the past, the displays of wares by manufacturers and jobbers in the hotel rooms and parlors were numerous and formed an attractive feature of the occasion. During the morning hours they were thronged with interested visitors, and at 2 p.m. were closed until adjournment of the business session in the evening.

An elaborate programme of entertainment was provided for members of the convention, their wives and visitors, which included boat and automobile rides and a trip to the Electric Park, all of which contributed in no small degree to the enjoyment of those in attendance and evinced a spirit of hospitality that makes Detroit a most popular convention city.

Convention Committees.

Following the call to order, Wednesday, Mayor William B. Thompson, in a genial address, tendered to the convention the city's cordial welcome, which was fittingly responded to by President E. B. Standart. In accordance with the programme the convention committees were then announced, as follows:

CONSTITUTION AND BY-LAWS: J. G. Patterson, Detroit; Mr. Smith, Jackson; J. H. Temmick, Greenville; C. E. Pipp, Muskegon; Frank Bock, Battle Creek.

QUESTION BOX: A. T. Stebbins, Rochester, Minn.; John Popp, Saginaw; M. A. Benson, Saranac.

CREDENTIALS: C. M. Alden, Grand Rapids; M. Potter, Alpena; V. C. Wattles, Battle Creek; Wm. Hunter, Dowagiac; W. E. Van Dyke, Holland.

RESOLUTIONS: W. Harsha, Detroit; Fred. Ireland, Belding; E. S. Roe, Buchanan; Seth Hunt, Detroit.

AUDITING: J. H. Whitney, Merrill; G. W. Bruske, Saginaw; Chas. Sterner, Port Huron.

NOMINATING: Frank Brockett, Battle Creek; P. A. Wright, Holly; G. P. Griffin, Albion; C. Downing, St. Charles; T. Boylan, Boyne City; George Smith, Hillsdale; O. J. Darling, Detroit.

President Standart's Address.

After the reading of the minutes, the President delivered his annual address, in which, after extending greetings to the convention, he briefly reviewed the work of the year. Mr. Standart explained that not many addresses were on the programme, those charged with the preparation of it feeling that more time than usual might profitably be given to discussion of questions brought up through the medium of the Question Box. He suggested that it might be well for the association occasionally to meet in other cities than Detroit, such as Saginaw or Grand Rapids, so that members in the western part of the State would not have so far to come. Mr. Standart also paid a warm tribute to the splendid services of Mr. Scott as secretary.

P. A. WRIGHT,
Vice-President.

A. J. SCOTT,
Secretary.

Mr. Weber's Report as Treasurer.

The treasurer's report, presented by H. C. Weber, Detroit, disclosed a credit balance in the treasury highly gratifying to the association. The receipts for the year were shown to be $4273.65, which with the balance of $1821.39 on hand at last report, made a total of $6095.04. Expenditures for the year were $3548.21, leaving in the treasury a surplus of $2546.83. Nearly $500 will be added to this sum from programme receipts, which will make the treasury balance in excess of $3000.

Secretary A. J. Scott's Report.

The secretary's report reflected not only a marked spirit of progression on the part of the association as a whole, but it also bore unmistakable evidence of the able and painstaking management that has characterized the work of Mr. Scott. In part the report was as follows:

The past year has been a most satisfactory one for the Michigan Association, looking at the matter from every standpoint. To be sure we have seen years when a larger number of new members has been added, but the fact must be taken into consideration that we now have upon our membership list the majority of the Hardware dealers in the State, and the material from which we must select our new members is becoming more limited every year.

Nearly 700 Members.

Last year at our convention the secretary's report showed that we had 639 active members on our list. There have been quite a large number of changes in business during the past 12 months and 36 of our members have gone out of business during that time. Fifteen more have either resigned or been dropped from the roll for nonpayment of dues, which leaves 588 of last year's members still in good standing. To take the place of the 51 names which have been dropped we have added 91 new members, making a net gain of 40 members this year, and a total membership at the present time of 679.

Pure Paint Legislation.

Last year a resolution was adopted placing the association on record as in favor of the passage of a pure paint law in this State, and your officers were instructed to take steps to see that some measure of this kind was introduced into the State Legislature. When your Executive Committee met early in the present year, this question was taken up and carefully considered, and

there were those among your officers who felt that this important question should be more thoroughly discussed before any action was taken, so that in case we eventually did decide to secure some State legislation we would not find after we had done so that unscrupulous dealers in other States, profiting by the laws governing interstate commerce, would be enjoying an advantage over the legitimate dealers and manufacturers in our own State.

Our Executive Committee has been criticized for not carrying out the instructions of the last convention, but I hope that after this subject has been thoroughly discussed and we have heard the expressions of gentlemen from other branches of the trade, who have consented to come and give us the benefit of their experience, that we will be better able to determine what we want and then be prepared to go and get it.

Gaining Ground Against the Catalogue Houses.

In referring to the catalogue house question, it is difficult to sum up briefly the progress which has been made toward minimizing this class of competition. Those who make it a point to secure the latest catalogues have probably noticed that one of the largest firms has taken Hardware entirely out of its catalogues and publishes its Hardware quotations in an entirely different book. The latter is not sent out except on special request, and we have every reason to feel gratified at this change of policy.

A careful investigation of any one of the large Hardware mail order catalogues also develops the fact that the number of factory brands quoted therein is steadily decreasing, and the firms in the mail order business are being compelled each year to depend more and more upon

E. B. STANDART,
Ex-President.

HENRY C. WEBER,
Ex-Treasurer.

securing their own brands and building up a demand through their own efforts instead of reaping the benefit of the work of the retail dealer.

Incidentally it might be mentioned that one of the largest firms is now making a charge for its catalogues, although the amount paid is applied on future purchases of goods. Innumerable incidents and facts might be mentioned to show that we are gaining ground in our fight against the mail order business, but there is still an enormous amount of work to be done.

Publicity Advertising.

The questions of publicity advertising and so-called substituting, to which many of the popular magazines have been devoting so much space during the past year, were given a great deal of attention at the Boston meetings, and I hope that at this session our members will give expression to their feelings on these important topics.

Parcels Post.

The parcels post bill has again, temporarily at least, been defeated through the continued steady opposition of organized merchants, but already we can see signs of another attempt to saddle this iniquitous piece of legislation upon the people of the country at the next session of Congress. The persistency of those who favor it must be met with equal persistence on our part, and we must be prepared for a repetition of the campaign which we have carried on so successfully for several years. Overconfidence has lost many a battle, and we are not going to be caught in this way.

Paint Legislation.

In response to an invitation extended by the Association, E. W. Heath of Heath & Milligan Mfg. Company, Chicago, and chairman of the Legislative Committee of the Paint Manufacturers' Association of the United States, read a paper on "Paint Legislation," which proved to be a very clear and succinct presentation of a subject that is of vital interest, not only to the manufacturer and merchant, but to the consumer as well. That the convention was strongly impressed with the fairness of the remedial measure advocated by Mr. Heath was evident from the enthusiastic demonstration of approval which greeted the conclusion of his address. The paper as read was in part as follows:

Active Paint legislation started with the passage of a law by the North Dakota Legislature, approved March 6, 1905. After a few hours consideration, this Legislature passed an act which undertakes to prescribe the way in which the best mixed Paints should be made. The committee to which the bill was referred, and upon whose report it was passed, did not contain any member who professed to know anything of the complex science of Paint making; nor was there probably among the members of the Legislature a single individual who understood the scientific principles underlying the manufacture of good Paint; nor so far as can be learned did the Legislature undertake to get light upon this difficult subject from any one with practical experience in the manufacture of Paint,—and yet this Legislature, with an utter lack of understanding of the entire subject, assumed in a few hours to do that which the most enlightened and progressive Paint manufacturers have striven for fifty years to accomplish; that is, to determine how the best Paint could be made.

In the opinion of Paint manufacturers, this law is vicious in principle, in that it is framed upon discarded and obsolete ideas and is ambiguous on account of the misuse of terms.

Mischievous Discrimination.

In substance, the act provides that a Paint manufacturer who makes his Paint out of linseed oil, carbonate of lead, oxide of zinc, turpentine, japan and pure colors—can sell in the State of North Dakota without any restriction or penalty whatever. On the other hand, one who uses in his mixed Paint any other than the above mentioned ingredients is guilty of a misdemeanor, and punishable with a fine and imprisonment, unless he puts a label upon the can showing the true percentage of each and every ingredient other than those designated.

The title of the act is, "An Act to Prevent Adulteration and Deception in the Sale of White Lead and Mixed Paints." The inference to be drawn from the statute is,—that in the opinion of the Legislature the enumerated ingredients are the best ingredients, and hence a Paint made from these ingredients alone need not be labeled, but if any other ingredient is used it is an adulterant and the ingredients and percentage used must show on the label,—in order to prevent deception. In other words, the Legislature has made the label a badge of inferiority and adulteration.

If, therefore, the Legislature has, though with the best intentions, made an arbitrary and unscientific selection of ingredients, and if in consequence a Paint made from the prescribed ingredients may be in fact a very poor Paint, while a Paint made with other ingredients may be just as good as, or better than, any Paint which can be made from the prescribed ingredients used alone, the Paint manufacturer owes a duty to the people and to himself to show them that in buying a Paint they should not be guided by the presence or the abscence of a statutory label.

A Just Law Should Protect Alike

the rights of the manufacturer, the dealer and the consumer, and to be equitable, reasonable and enforcible its provisions should be such that it will not, as is the case with the law referred to, practically bar out a large variety of Paints.

The Paint manufacturers, whose wares have justly acquired a great reputation and a wide sale as the result of their intrinsic worth, wish it to be distinctly understood that they are as anxious as any consumer of Paint can possibly be to have the market rid of any spurious Paint which is not what it is represented to be. There doubtless are Paints which can properly be called adulterated, and with such the reputable Paint manufacturers have no sympathy. If such Paints are sold at a price out of proportion to their value—that is, if a man pays a first-class price and gets a second-class Paint—the buyer has been imposed upon. The reputable Paint manufacturers themselves suffer to a great degree from the unfair competition of such unscrupulous manufacturers. This, however, is not a failing of the Paint trade in particular, but is the same unfortunate trait of human nature disclosed in every line of business.

The Paint Manufacturers of Repute

in this country have expended millions of dollars in the perfection of formulas and have brought their product to a high state of efficiency and merit. On this merit and the results obtained by the use of their Paint these manufacturers have built up an enviable reputation.

They are not complaining because their industry has been selected for the purpose of legislation. Their objection is to the character of the legislation itself. The purpose of the legislation is entirely commendable and the Paint manufacturers desire to see such purpose accomplished, but the only legislation by which it can be accomplished is intelligent legislation.

The Term Pure Misapplied.

The North Dakota statute has become quite widely known as a "pure Paint law," and some of the trade organs of the country have used this term in support of legislative measures. Such a title involves a misuse of the term, and the association and its Legislative Committee in particular, has been devoting its energies during the past 18 months to showing the fallacy involved in the use of the term "pure Paint."

The term "pure Paint" implies a standard. The term "pure" is misapplied, if used to designate any article except one which has a natural standard—such as milk, butter and similar food products—or which consists of a single element—such as gold, silver, &c.—but to describe any given kind of Paint as "pure" is as absurd as to talk about pure watches, pure pianos or pure umbrellas. The fallacy involved is that the term "purity" is used instead of "efficiency." Paint being a manufactured composite mixture, that Paint is the most efficient which accomplishes to the greatest degree and for the greatest length of time the purposes of Paint.

The only standard for Paint is "efficiency," and to describe it as "purity" is to borrow a phrase from pure food legislation which has no proper application to Paint.

The North Dakota statute is therefore vicious, in that it undertakes impliedly to set up a legislative standard of so-called purity. Furthermore, the standard set up fails to recognize an entire generation of advance in the technology of Paint making.

Joint Conference Bill.

For these reasons the Legislative Committee of the Paint Manufacturers' Association has been devoting a great deal of time and effort to prevent the passage by any other State of the arbitrary and discriminating Paint law of North Dakota. It has been urging the passage of its own bill, which, if enacted into law, gives the people what they are demanding and at the same time treats all manufacturers equally.

The bill referred to as the Legislative Committee's bill is the form of bill recommended to their respective associations by committees of the Paint Manufacturers' Association of the United States, the National Paint, Oil and Varnish Association and the National Association of Master House Painters and Decorators of the United States and Canada, and was adopted at a joint conference held in Philadelphia between these commtitees during May, 1907. The text of this bill is as follows:

SECTION I. Whoever shall expose for sale or sell within this State any Paint, Turpentine or Linseed Oil which is labeled or marked in any manner so as to tend to deceive the purchaser as to its nature or composition, or which is not accurately labeled as hereinafter required, shall be guilty of a misdemeanor and for each offense shall, upon conviction thereof, be punished by a fine of not less than $25 and not more than $100, or by imprisonment in the county jail not exceeding 60 days.

SEC. II. The term "Paint" as used in this act shall include oxide of zinc, red lead, and white lead, dry or in any kind of oil, and any compound intended for the same use, colors ground in oil, paste or semipaste Paint, and liquid or mixed Paint ready for use.

SEC. III. The label required by this act shall clearly and distinctly state the name and residence of the manufacturer of the Paint, or of the distributer thereof, or of the party for whom the same is manufactured, and show the name and, with substantial accuracy, the percentage of each ingredient both solid and liquid contained therein; provided, however, that in case of Paint other than white Paint, the ingredients other than the coloring material may be treated as 100 per cent., in which case it shall be necessary to state not only the name and percentage of each ingredient other than the coloring material, but also the description or trade name of such coloring material, and state with substantial accuracy its chemical analysis. Said label shall be printed in the English language in plain legible type.

SEC. IV. The having in possession by any person, firm or corporation dealing in said articles, any articles or substances hereinbefore described and not properly labeled, as provided in this act, shall be considered *prima facie* evidence that the same is kept by such person, firm or corporation, in violation of the provisions of this act and punishable under it.

SEC. V. The Dairy and Food Commissioner of the State is charged with the proper enforcement of all of the provisions of this act.

SEC. VI. The said commissioner and his assistants, experts, chemists and agents shall be duly authorized for the purpose and shall have access and ingress to all the places of business, stores and buildings used for the sale of Paint, Turpentine or Linseed Oil. They shall also have power and authority to open any package, can, jar, tub or other receptacle containing articles that may be sold or exposed for sale in violation of the provisions of this act.

SEC. VII. This act shall take effect and be in force from and after January 1, 19—.

The Paint Manufacturers' Association has indorsed this bill. The other committees will report in favor of its indorsement at the coming annual meetings of the respective associations which they represent. As soon as these indorsements are obtained the producers of raw material—lead, zinc, linseed oil and turpentine—will be urged to lend their indorsements. With the indorsements of these respective bodies, representing, as they will, the producer, the manufacturer, the distributer and the consumer, it would appear that this bill will be a formidable legislative weapon with which to combat any other measure which may be introduced.

Bills in Different States.

This committee has been giving the question of all kinds of legislation the very closest study for the past 18 months. Its representatives have appeared before the committees of the legislatures of all the States which have introduced Paint bills this year, in the effort to secure uniformity and comprehensive legislation, where legislation was demanded.

Between the middle of January and the middle of February one or more Paint bills were introduced in each of the following States: Alabama, Texas, South Dakota, Iowa, West Virginia, California, Kansas, Indiana, North Carolina, Minnesota, Wisconsin, Idaho, Pennsylvania, Illinois and Missouri. In June a bill modeled upon the North Dakota law was introduced in the New York Legislature.

In all, 16 States introduced a total of 46 Paint bills. The North Dakota law was the substance in one or more bills introduced in each of 11 States and in Congress. In some States as many as three different forms of the North Dakota law appeared.

The Committee's Bill Is Substantially the One

which was later passed by Minnesota, Iowa and South Dakota. In explanation of this bill it should be stated that any idea of preparing a substitute bill, which could be unconstitutional or which would be an unenforcible joker, was discarded on the start. The reason for this action was that the committee felt absolutely certain that not only would the introduction and support of such a bill degrade the association's fair name, but that a policy of subterfuge would so impair the association's future prestige that its influence in subsequent legislatures would be nil. They also felt that such a course would not only be iniquitous, but suicidal.

It is unnecessary to assure you that the committee at the outset of its labors was unanimously of the opinion that if the passage of the most vicious Paint bill could be defeated by the payment of a nickel to a member of the Legislature the committee would not permit the expenditure. We felt certain that as our cause was righteous there could be no more effective way of promoting it than by educational methods. We felt that the majority of men were honest and that the greatest foe we had to fear was ignorance. The statement is therefore emphatically made that not one penny was spent in any way of which any member of our association need be ashamed.

It is earnestly hoped that uniformity of laws in States where Paint legislation must be had may be brought about. You gentlemen who are distributers of the product will easily recognize the hardship to manufacturers in case a different label is required in different States.

Uniform State Laws Preferable to Federal Legislation.

There seems to be quite a widespread opinion among the public that Federal legislation will solve this problem of uniformity as to the label. Some who are strongly urging Federal legislation are doing so under the mistaken impression that Federal legislation means exclusive legislation, and that the passage of a Paint law by Congress deprives the States of their power to legislate independently on the same.

Others know better than this and realize that the States can still legislate; but they think that the Federal Legislature has moral influence upon State legislatures and will cause them to adopt State laws in conformity with a Federal law.

We believe both classes are equally mistaken. Congress passed the National Pure Food and Drug law a year ago last June and it became effective on January 1, this year. The supporters of it thought that it would have the same effect, above mentioned, of securing uniformity of State laws on the subject.

Our committee has been receiving a complete record of all bills introduced in the Legislature of all the States which have had legislative sessions this year, and many States have introduced during the past sessions food and drug bills entirely different from the National law. Furthermore, we have seen official letters from the food commissioners of several important States refusing to accept the standard set up by the Federal officials under

the Federal law, and insisting that they would not be controlled or regulated thereby.

In the light of this and other similar experiences it is visionary to hope that Federal legislation can materially affect State legislation.

The investigations which this committee has made of the subject of Federal legislation we think should have some weight among those who have not so closely studied the proposition.

Our conscientious belief, in view of the foregoing, is that the most good can be accomplished by the introduction and passage of uniform State bills until there is a recognized and acceptable law in a number of prominent States, the working of which has been tested and the defects discovered and remedied, before any attempt to pass a Federal measure, for once a Federal law is enacted it is a matter of the utmost difficulty to amend it to cover defects which might be discovered after the law is put in operation.

Absolute Equality and No Discrimination.

This committee of the Paint Manufacturers' Association has not, in the adoption of its policy in its activities, favored one pigment or class of pigments against another pigment or class of pigments, nor will it do so in the future. It is a fact that there exists an honest difference of opinion among manufacturers as to the merits of different pigments. We have stood upon a platform of absolute equality and nondiscrimination. We have insisted that if one class of pigments must be labeled, all classes of pigments must be labeled and that Paints must be sold upon the merits of their ingredients and not by legislative favoritism.

In this connection we are proud to state that the fairness of this position is appreciated by certain large interests which would be favored by discriminating legislation, but they are broad and fair-minded enough to agree that all should be treated alike.

The committee also stands for the prohobition of the use of any term which does not properly apply to the product and against any and all spurious or misleading labels, and for the sale of Paint on its own merits and under its own name.

Charles G. Field, assistant manager of the National Lead Company, Chicago, followed Mr. Heath in an interesting address on "White Lead and Paint Legislation," discussing the subject from the standpoint of the white lead manufacturer. Indorsing all that had been said by Mr. Heath, he pleaded, "not for that legislation which will set white lead, zinc, barytes or any other pigment of ready Mixed Paint upon any pedestal, but for that legislation which shall protect the consumer against the misbranding and misstatement with reference to any of these pigments."

Retailers' Relations with Jobbers.

After hearing the reports of committees on Auditing and Credentials, which followed the call to order at Thursday's session, an excellent paper dealing with "The Relation of the Retailer to the Jobber" was read by Porter A. Wright. One of the phases of this many-sided question, which received attention in this discussion, was the importance of courteous treatment of jobbers' traveling representatives by merchants. On the other hand, it was pointed out that the jobber owes it to the retailer to protect him as fully as possible in his trade. The practice, in some instances followed by jobbers, of selling Tools and other goods direct to factories was deprecated, as was also the disposition of merchants to place their orders direct with manufacturers.

Bookkeeping and Salesmanship

"Bookkeeping and Salesmanship" was the topic of an address delivered by W. P. Bogardus, Mt. Vernon, Ohio, ex-president of the National Retail Hardware Association. Because it embodied the results of a lang and successful experience, this paper received marked attention, and was in part as follows:

To a great many people engaged in business the keeping of books is an undeniable drudgery. I confess, however, to have never looked upon the work from that standpoint. It has always seemed to me to be the key to any man's business, for the books contain the records of the business. The great problem for me has been how to get the complete record with the least amount of work. To sit at a desk and copy items from a blotter to a day book, thence to a journal and from there to a ledger has appealed to me as a useless and profitless task. To have to charge the same item three different times opens a way for mistakes, and does not add anything to the security of the account. How to change the old methods and still retain safety and security and correctness of the accounts has been the problem that the advocates of advanced methods in bookkeeping have had to solve, and to an certain extent the problem has been solved. In a modern business I have found that a

Cash Register in Connection with a Loose Leaf Daybook and Ledger Combined

has given me the best results with the smallest amount of work. One inflexible rule must be adopted in connection with the use of a register—namely, a record of every transaction in the store must go through the register. Our register gives us a record of the total amount of cash sales with a detailed slip to verify amounts. At night when we are ready to close we have the following information:

Total cash sales.
Total paid out.
Total received on account.
Total amount of charges.
Total business for the day.
Total amount of business each person in the store who has waited on customers has done.

With this information I am enabled to make a record for each day, and can judge the value of my clerks and estimate the work they are doing.

A Spur to Efficiency.

Each clerk has a knowledge of the amount of busiiness done by other clerks, which is, I think, a spur to increase their efficiency. As each clerk has a drawer which is used by him exclusively, and makes up his own record of his day's work, which must agree with the report I take from the register, the mistakes made during the day—and we all make them—are placed where they belong. There is no dodging this, and as a result there is greater care used by each clerk in the work he does for the store. To make men honest is a difficult matter. To make men careful is often a matter of education.

The register furnishes to the bookkeeper every night slips for all goods sent out of the store and charged; slips of all money received on account, and slips of all money paid out.

I have found that a loose leaf journal ledger is best—that is, a loose leaf book so ruled that the items of an account can be written in on the debit side. Then when it becomes necessary to make out an account there is but one book to refer to.

The slips from the register are, of course preserved, as they are the original entries and should be used to check up all the bills before they are presented to the customer. With the checks and counter checks of this system and its division of the responsibility each person is charged with only the share that justly belongs to him.

Local Newspaper the Best Advertising Medium.

But while we are organizing our force in our stores to the highest conditions of perfection on these lines we must remember that there are other things that require our attention. To put a fine assortment of goods on our shelves and to have a thoroughly organized system of handling them is not all. We buy goods to sell. Somebody wants the goods we have. The great problem for us to solve is, How are we going to let the people know that we have what they want? Some say, advertise in the programmes of entertainments given in your town; others say advertise on fences, while others have schemes that will put money in their own pockets and very little in yours. But after years of experience, to my mind the best way is to use the newspapers. Change your advertisement every week, and call the attention of the public to seasonable goods in their season. But do not say anythings that is not true.

Business is based on confidence. When that is not done there is no future for your business. When after you have told your story so as to attract the attention of the public and they come to your store to see, then it is the salesman who has the work to do. If the sale is made the immediate end is gained, but there is more in this sale than the selling of one article. It is up to the

Salesman to Make a Favorable Impression

on his customer. Every salesman is a standing advertisement for the man for whom he works. If he is a mere "order taker" he makes no impression on the trade, and a man who has been served by him would as soon go to some other store when he wants more goods. Such a salesman has no value as an advertiser, and the less a store advertises the nearer it is to failure. If, after

using an article, a customer finds that what has been told him about it is true, then a certain degree of confidence is established. If frequent sales are made with the same result, then confidence is developed and a permanent customer is made for the store.

There is only one way to establish this confidence and keep it, and that is always to tell the truth. A liar has no permanent place in business life. With a well equipped and systematically managed store, with judicious advertising, and salesmen who are working for the interest of the ones who are giving them a living, there is every reason that experience can give to encourage the owner that success will crown his efforts.

Address on Behalf of Jobbers' Association.

From a committee of local Hardware jobbers selected to represent the National Hardware Association at the convention, Mr. Delamater of Freeman, Delamater & Co., was selected to address the assembly. Voicing the views of Hardware jobbing interests, he spoke in part as follows:

On behalf of our committee I am pleased to extend to this convention the fraternal greetings of the National Hardware Association. Both the jobbers' and the national and State associations of retailers are working along much the same lines for the general betterment of business conditions.

I very strongly believe in such organizations, membership in which broadens one out and tends to promote strong friendship and co-operation among rivals for business. By conference in conventions, and with one another, there are many opportunities for getting new ideas and learning better ways for doing business.

One of the Great Advantages

of these associations, and possibly the greatest, is the concentration of the influence of the individual into a strong and powerful unit, which at once commands attention and respect. As individuals we may see many things which should be corrected and changed, but the influence of single individuals on great public questions carries but little weight. Yet when these are concentrated in one harmonious and active body of men you can see at once the difference in the result of efforts directed toward the accomplishment of any worthy object.

You have all become familiar with the parcels post measure and also the catalogue house question. Both of these are of vital importance, not only to you as retailers, but also the jobbers, who look to you for business. The manufacturer, it seems to me, should, above all others, be greatly interested as to how their wares shall be distributed, and whether under their method of distribution dealers are allowed a fair profit for doing business. I am glad to be able to say to you that the National Hardware Association has placed itself on record as against both these important questions. The influence of the great body of Hardware jobbers has been unanimously against the parcels post, and I believe that their active efforts, aided and strengthened by the State and national associations of Hardware retailers, has done more to defeat this measure so far than all others. I wish at this time, however, to warn you that the fight is not over, and that you must be prepared to continue your opposition to it when it again comes up before Congress.

Resolutions.

Among the resolutions adopted were the following:

Whereas, We are informed through recent press dispatches that Postmaster-General Meyer has expressed himself as favorable to a reduction in the rates of postage on merchandise and is preparing to submit a recommendation along this line at the next session of Congress; and

Whereas, We are aware that a change of this kind, in addition to creating an enormous deficit in the Post Office Department, would be equivalent to granting a concession to a small class at the expense of the majority; therefore be it

Resolved, That we respectfully request an opportunity to present our views on this matter to the Honorable Postmaster-General before he definitely places himself on record as favoring this radical change; and, be it further

Resolved, That our Senators and Representatives in Congress be communicated with and requested to use their influence with Mr. Meyer to show him the injustice of his present attitude.

Whereas, Information has been received that another attempt will be made at the next session of Congress to pass the vicious measure known as the Parcels Post bill; therefore we, the Michigan Retail Hardware Association, composed of business men from all parts of the State, do most earnestly protest against its passage, believing, as we do, that said Parcels Post bill is a piece of vicious class legislation pushed in the interests of the catalogue houses to the great detriment of the legitimate retail dealers throughout the country; therefore be it

Resolved, That our Senators and Representatives from Michigan be earnestly requested to use every honorable means in their power to prevent its passage.

Resolved further, That a copy of these resolutions be forwarded to each of our Senators and Representatives and the chairmen of the Committees on Post Offices and Post Roads.

Whereas, Many of the leading magazines have during the past year pursued a policy of creating prejudice against the retail merchants in the minds of the consuming public through articles on the subject of so called substituting; and

Whereas, Every legitimate dealer is justified in selling those lines of goods which in his opinion have merit and are of good value for the money, irrespective of whether these goods are advertised to the public or not; therefore be it

Resolved, That we condemn this tendency on the part of those magazines in misrepresenting our attitude in the above manner.

In accordance with suggestions made by the secretary in his report, the Executive Committee was, by resolution, empowered to revise the constitution and by-laws, and report the result of its labors to the succeeding convention.

Election of Officers.

The election of officers for the ensuing year resulted in the choice of the following officials:

PRESIDENT, C. M. Alden, Grand Rapids.
VICE-PRESIDENT, P. A. Wright, Holly.
SECRETARY, A. J. Scott, Marine City.
TREASURER, Wm. Moore, Detroit.
EXECUTIVE COMMITTEE, full term: E. B. Standart, Holland; Fred Ireland, Belding; J. M. Williams, North Adams; O. H. Gale, Albion; G. J. Frank, Bay City; to fill vacancy, one year, Fred M. Gartner, Wyandotte.

Detroit Again Chosen.

When the question of choice of location for the next convention came up, it was found that there were other aspirants for the honor besides Detroit. Invitations were presented from the cities of Flint and Saginaw, asking the privilege of entertaining the next annual gathering. Detroit's appeal to be continued in favor was eloquently voiced by H. C. Weber, with the result that by a nearly unanimous vote it was again chosen and will be the place of assembly for the fourteenth convention of the association, to be held next year.

CONVENTION NOTES.

As indicative of the important position now occupied by Hardware merchants as distributers of Paint, of the 53 concerns represented at the convention, not less than 12 were manufacturers of Paints and Varnish. These included some of the largest and most representative factories in the country.

The only regretable incident that occurred to mar the meeting was the unfortunate accident that befell T. W. Reynolds of Berrien Springs. His left arm was fractured by a fall, which also resulted in a serious sprain of his right wrist.

Gratuitous service of their lines for both local and long distance calls was tendered to the members of the convention by the Michigan State Telephone Company and the Home Telephone Company. Presentation of badges was the only identification required, and it is needless to say that the courtesy thus shown was highly appreciated.

Among visiting retailers from other States were A. T. Stebbins, Rochester, Minn., first vice-president of the National Retail Hardware Association; C. A. Peck, Berlin, Wis., secretary of the Wisconsin State Association, and W. P. Bogardus, Mt. Vernon, Ohio, ex-president of the National Association. Mr. Bogardus made an interesting address on "Bookkeeping and Salesmanship," as referred to in another column. Talks on insurance were given by Mr. Stebbins and Mr. Peck. Information upon this subject was of especial interest to the Michigan body, which has up to the present time no insurance company of its own. Members were, therefore, anxious to learn of the workings of the mutual plan, so successfully operated in other States, and evinced a desire to participate in its benefits. Both the Wisconsin and Minnesota companies are authorized to do business in Michigan, and as members become more conversant with the stability and cheapness of the security they offer their list of policyholders in that State is being extended.

Weston Wrigley, Toronto, Can., secretary of the Ontario Retail Hardware and Stove Dealers' Association, was a welcome visitor to the convention. Speaking for the Ontario Association, Mr. Wrigley said that though behind the American associations in rapidity of development, the movement toward organization is steadily gaining force. But on account of adverse legislation secured at the instance of the old line fire insurance companies, it was stated that the organization of mutual fire insurance companies in connection with the Ontario Association was at present impossible. Notwithstanding this handicap, however, much is being accomplished in defence of trade interests against the hurtful effects of catalogue house competition and other harmful influences common to both countries.

The Hardware jobbers and manufacturers of Detroit, with the same care and forethought exercised on previous occasions were not behind hand in providing entertainment for members and guests of this convention. Besides entertaining them most hospitably at their places of business, where the regular routine of work was practically suspended to give attention to visitors, a delightful boat ride was provided on Friday evening. This delightful trip was taken by a large number of members who remained after the close of the meeting to enjoy it.

EXHIBITS AND EXHIBITORS.

Exhibits at the convention were made by the following manufacturers and jobbers:

ACME WHITE LEAD & COLOR WORKS, Detroit, Mich.: Paints. Represented by S. H. Hart and G. C. Burnham.

ALUMINUM COOKING UTENSIL COMPANY, Pittsburgh, Pa.: Aluminum Cooking Utensils. Represented by Charles W. Fribley.

AMERICAN WRINGER COMPANY, New York City: Wringers. Represented by N. B. Hutton. Souvenir, memorandum book.

AMERICAN STEEL & WIRE COMPANY, Chicago, Ill.: Wire Fencing. Represented by W. H. Crawford, S. E. Olcott and L. N. Silverman.

E. C. ATKINS & Co., Indianapolis, Ind.: Saws. Represented by W. E. Stalnaker and Robert Eveland. Souvenir, watch fob.

ATLANTIC STAMPING COMPANY, Rochester, N. Y.: Tinware, &c. Represented by T. B. Burton.

BRADLEY & VROOMAN COMPANY, Chicago, Ill.: Paints. Represented by C. G. Throop and F. W. Eling.

ESTATE OF P. D. BECKWITH, INCORPORATED, Dowagiac, Mich.: Round Oak Stoves and Ranges. Represented by John A. Howard, James C. Van Male and W. T. Leckie. Souvenir, handsome stein with Round Oak monogram.

BERRY BROTHERS, LIMITED, Detroit, Mich.: Varnishes. Represented by P. B. Weeks and Frank McCall. Souvenirs, medal and mirror.

BOSTWICK-BRAUN COMPANY, Toledo, Ohio: Wholesale Hardware. Represented by H. W. Aulsbro, W. J. Bresy, W. H. Brown, H. D. Ranney, C. W. Brown, S. W. Johnson, H. T. Morgan and M. H. Nusbaum.

BOYDELL BROS. WHITE LEAD & COLOR COMPANY, Detroit, Mich.: Paints. Represented by Wm. Rennie, Jos. Meyers, Andrew Hindmarsh and Frank Boydell. Souvenir, watch fob.

BROWN STAMPING COMPANY, Toledo, Ohio: Tinware. Represented by A. L. Baker and John Q. Palmer.

BUHL SONS COMPANY, Detroit, Mich.: Rifles, Prepared Roofing, &c. Represented by Chas. V. Hetts.

CARBORUNDUM COMPANY, Niagara Falls, N. Y.: Abrasive Materials. Represented by Geo. W. Chorman and Geo. E. Dresser. Souvenir, Pocket Hones.

COLDWELL LAWN MOWER COMPANY, Newburgh, N. Y.: Lawn Mowers. Represented by J. T. Bullen.

COLUMBIAN HARDWARE COMPANY, Cleveland, Ohio: Builders' Hardware. Represented by F. W. Wood and R. J. Venning.

CRIBBEN & SEXTON COMPANY, Chicago. Represented by W. L. Jackson and R. H. Wheeler.

DANGLER STOVE COMPANY, DIVISION AMERICAN STOVE COMPANY, Cleveland, Ohio: Vapor Stoves. Represented by W. J. Best.

DETROIT REGISTER COMPANY, Detroit, Mich.: Wall Registers.

DETROIT WHITE LEAD WORKS, Detroit, Mich.: Paints. Represented by H. P. Barringer and J. G. Riley.

FOREST CITY PAINT & VARNISH COMPANY, Cleveland, Ohio: Paints and Varnishes. Represented by R. C. Talbot and A. F. Mattison. Souvenir, metal pin tray.

EARNEST GOSCH, Freeport, Mich. Patent Vent Stops. Represented by R. Wolcott.

HEATH & MILLIGAN MFG. COSMPANY, Chicago, Il.: Paints and Colors. Represented by Geo. L. Bouton and A. D. Crain. Souvenir, memorandum book.

HIGHT MFG. COMPANY, Toledo, Ohio: Carpenters' Tools. Represented by H. C. Bussell.

IDEAL FURNACE COMPANY, Detroit, Mich.: Warm Air Furnaces, Hot Water and Steam Boilers.

LOWE BROTHERS COMPANY, Dayton, Ohio: Paints and Varnish. Represented by F. O. Downer and R. E. Longman.

MCINTOSH HARDWARE CORPORATION, Cleveland, Ohio: Cutlery. Represented by J. S. Harris. Souvenir, bottle ink and button.

MALLEABLE STEEL RANGE MFG. COMPANY, South Bend, Ind.: Stoves and Ranges. Represented by H. A. Todd and J. F. Weiss. Souvenirs, hat pin and watch fob.

MARTIN-SENOUR COMPANY, Chicago, Ill.: Paints. Represented by F. A. Somers and O. H. Gocke. Souvenirs, pocket comb and pencil case, watch and fob.

NATIONAL STOVE COMPANY, Lorain, Ohio: Stoves and Ranges. Represented by A. P. Sweatman, T. J. Moran and J. A. Alexander. Souvenirs, shopping list and pin tray.

OHIO VARNISH COMPANY, Cleveland, Ohio: Varnishes. Represented by H. H. Adams and F. E. Tyler.

OMAHA LIGHTNING ROD & ELECTRIC COMPANY, Omaha, Neb.: Lightning Rods, &c. Represented by T. B. Adams.

ONEIDA COMMUNITY, LIMITED, Oneida, N. Y.: Animal Traps and Silverware. Represented by Frank H. Primo.

WILLIAM PETER ESTATE, Toledo, Ohio: Door and Window Screens. Represented by A. J. Cone, Alvin Peter, Fred Craston and Wm. Prang.

PITTSBURGH STEEL COMPANY, Pittsburgh, Pa.: Wire Fencing. Represented by F. A. Tower and E. N. Morey. Souvenirs, nail puzzle and dictionary.

REMINGTON ARMS COMPANY, Ilion, N. Y., and UNION METALLIC CARTRIDGE COMPANY, Bridgeport, Conn.: Arms and Ammunition. Represented by John S. Cole, Jr.

REVERE RUBBER COMPANY, Chicago, Ill.: Garden Hose. Represented by A. F. Aricox and S. F. Denny.

OSCAR C. RIXSON COMPANY, Chicago, Ill.: Door Checks and Locks. Represented by H. A. Stoddard and M. H. Force.

ROCHESTER STAMPING COMPANY and ROBESON CUTLERY COMPANY, Rochester, N. Y.: Metal Ware and Cutlery. Represented by E. C. Gale, C. W. Silcox and H. M. Rogers.

SCHROEDER PAINT & GLASS COMPANY, Detroit, Mich.: Paints and Glass. Represented by Fred. W. Schroeder and Fred. Renched. Souvenirs, memorandum book and other novelties.

SHERWIN-WILLIAMS COMPANY, Cleveland, Ohio: Paints and Varnishes. Represented by R. W. Sample, Ralph Baker, W. F. Gallinger and H. M. Kipp.

SILL STOVE WORKS, Rochester, N. Y.: Stoves and Ranges. Represented by B. M. Ross and J. A. Schmidt. Souvenir, trick cigar.

SIMONDS MFG. COMPANY, Fitchburg, Mass.: Saws. Represented by J. Van Dyke, Jr., Will J. Feddery and A. J. Basse. Souvenir, Carpenter's Guide.

STANDARD LIGHTING COMPANY, Cleveland, Ohio: Represented by A. P. Sweatman, T. J. Moran and J. A. Alexander. Souvenir, shopping list and pin tray.

STANDART-SIMMONS HARDWARE COMPANY, Toledo, Ohio: Wholesale Hardware. Represented by W. H. Standart, F. E. Moulton, C. B. Bennett, E. C. Weeber, Fred. R. Russell, A. L. Peck and W. N. Tenhopen. Souvenir, button and streamer.

L. S. STARRETT COMPANY, Athol, Mass.: Mechanical Tools. Represented by L. R. Hartley, Jr. Souvenirs, Eye Glass and Screw Driver.

VERMONT FARM MACHINE COMPANY, Bellows Falls, Vt.: Cream Separators. Represented by L. H. Jenns.

WAHLE FOUNDRY & MACHINE WORKS, Davenport, Iowa: Snowball Washing Machines. Souvenir, snowball girl.

GEO. C. WETHERBEE & Co., Detroit, Mich.: Excello Washing Machines.

WHEELING CORRUGATING COMPANY, Wheeling, W. Va.: Galvanized Ware. Represented by J. H. Robinson and Andrew Glass.

WHITE LILY WASHER COMPANY, Toledo, Ohio, and Davenport, Iowa: White Lily and other Washing Machines. Represented by R. P. Searle and O. F. Victor.

WINCHESTER REPEATING ARMS COMPANY, New Haven, Conn.: Winchester Guns, Loaded Shells and Metallic Cartridges. Represented by J. E. French.

YALE & TOWNE MFG. COMPANY, New York: Locks and Builders' Hardware. Represented by E. C. Waldvogel, H. B. Smith, C. M. Moulton, A. H. Lee, J. F. Putnam, A. H. Nichols and W. J. Laffrey.

HOMER PARMELEE died at the home of his brother, Justin Parmelee, in Chicago on the 12th inst. Mr. Parmelee was in his 89th year, having been born December 31, 1818, at Middlebury, Vt. He was the oldest of 12 children of Howell Parmelee of West Troy, N. Y., the inventor of the cook stove known in those early days as the Parmelee Diamond Cook. Homer Parmelee was a pattern maker by trade and was employed for years by Bartlett, Hayward & Co., Baltimore, Md., on account of his inventive genius, many practical machines in use in the boiler shops being originated by him. In his 80th year he invented the Parmelee Pipe Wrench, now made by the Parmelee Wrench Company, Chicago. After five years' enjoyment of the fruits of this invention Mr. Parmelee failed in health, and transferred the burden of his business affairs to his brother, Justin Parmelee, who, with his nephew, continues the manufacture of the Wrench.

The old firm of L. Emery, Jr., & Co., Bradford, Pa., which has been engaged in business in Hardware and allied lines since 1876, has been succeeded by the Emery Hardware Company. C. M. Luttrell has taken over the interest of W. R. Weaver, deceased, and assumed the active management of the business. State Senator Lewis

Emery, Jr., the founder of the business, will continue as senior partner, controlling the largest interest. Mr. Luttrell is a well-known Southern Hardwareman, having had an experience covering a period of 25 years, as clerk, traveling salesman and proprietor. In 1891, with small capital, he established himself in business at Brewton, Ala., which he managed so successfully that the Luttrell Hardware Company was incorporated 10 years later, with a capital of $30,000, Mr. Luttrell being president and general manager. Some months since Mr. Luttrell disposed of his interest in the company and came North. The new firm intends materially to enlarge its wholesale Hardware, Crockery and general supply departments, and is adding a complete line of Sporting Goods.

PROMOTING THE SALE OF PREPARED PAINT.

THE Bureau of Promotion and Development of the Paint Manufacturers' Association of the United States, Chicago, Ill., is sending out a circular letter to handlers of Paint in which attention is called to the advantages to the merchant of handling prepared Paint. It is pointed out that the sale of prepared Paint in the country has grown from nothing in 1866 to over eighty millions of gallons in 1906, and yet the industry may be said to be in its infancy. Its further development, it is stated, depends not only on the effort of the manufacturers constantly to increase the excellence of their product, but also on the efforts of merchants in going after the business with enterprise and energy and educating the public concerning the virtues and merits of prepared Paint. Realizing the great selling force of a proper knowledge of Paints and Paint ingredients, the Paint Manufacturers' Association is arranging to place in the hands of merchants practical Paint facts and selling suggestions in the hope that the ideas advanced may be incorporated into tangible sales arguments by every handler of Paint and the clerks in his employ. This matter will be sent out in connection with a series of circular letters during the next few months. Also on September first will be sent a valuable contribution on Paint in the way of a Paint catechism, compiled by Dr. G. B. Heckel, a well known authority on this subject. In line with this policy of the association the circular letter is accompanied by a chart indicating the increased cost of representative items in the principal classes of crude material used by makers of good Paint.

MISCELLANEOUS NOTES.

The Wonderful Lightning Egg Beater.

The Ohio Cooker Company, Toledo, Ohio, is offering an egg beater consisting of a glass graduated jar, having a close fitting cover and a dasher, as in a churn. Two circular perforated discs are attached to the dasher so that when not in use they are about half way between the top and bottom of the jar. Between the lower disc and the bottom of the jar is a coiled spring. In use the dasher is forced down by the hand of the operator, the coiled spring returning it again. The action forces the contents of the jar through the perforations of the double dasher, and will satisfactorily whip the most refractory eggs or cream, it is explained, in one minute. The beater has a tight fitting cover which prevents the spattering of the contents of the beater, and prevents the entrance of foreign matter. It is designed as an egg beater, cream whipper, lemonade and egg nogg mixer, &c. It can also be used as an ice cream freezer. The graduated jar is useful as a measure, as the sides have marks by which weights or measures of liquids, flour, sugar, &c., may be accurately determined.

The Kaffir Corn Header.

The Eagle Mfg. Company, Kansas City, Mo., is manufacturing a Kaffir corn header which cuts off and elevates the corn heads into any ordinary wagon bed to which the machine is attached. A sprocket chain drive is now being used in place of a canvas belt, as heretofore. By means of a lever the machine can be raised and lowered while in operation, to gather uneven corn.

Curley Ideal Safety Razor.

J. Curley & Bro., 318 Broadway, New York, have improved the Curley Ideal safety razor in several important details. The new model, patented June 25, 1907, makes the blades absolutely interchangeable, a condition that was not always possible in the past. As now made, the sheet metal rounded back of the frame has a two-piece split brass tube curved between ends so that when it is inserted in the back and held at the inner end by pinning, there is enough flexibility to adjust itself to slight inequalities of the round back of the blade, friction tight, and yet hold it rigidly in place. Corrugations on the back of the tang have also been added as an aid in stropping. The offer is made to dealers that if they have in stock any Curley Ideal safety razors of the two blade style, or sets of two blades, up to seven, they can be returned and new frames will be put on and furnished free of charge, thus making them interchangeable with regard to blades. The guard of this razor is grooved diagonally, so as to permit of shaving with a sliding diagonal stroke with safety, and is permanently secured to the frame in such a way that by turning it over it guards equally well, whether shaving right or left hand. The razors are put up with one or more blades up to seven and mounted regularly in black or white handles. The blade proper is practically of uniform thickness, with round metal back.

Pocket Watch Bank.

The Savings Bank Mfg. Company, 85 Fifth avenue, Chicago, Ill., represented by E. S. Pease, Temple Court

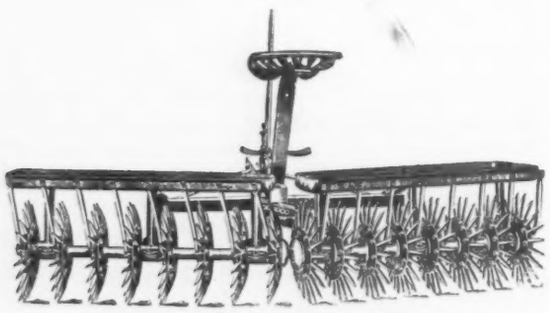
Keyless Pocket Watch Savings Bank.

Building, New York, for the territory east of Pittsburgh and Buffalo, is marketing the pocket watch savings bank, here shown. It is 2¼ in. in diameter, and the thickness of a gentleman's watch, made in two parts of stamped steel, polished and heavily nickeled, with milled edge. The bank has an opening of proper size to receive a 10 cent silver piece or dime, one of which appears in the illustration in the process of entering. In addition to regular trade channels they are being distributed through the medium of savings banks who in turn issue them to depositors, who are expected to fill them with dimes until $5 worth, the bank's capacity, has been inserted, when the watch bank is returned to the savings bank and opened, the money contents being placed to the credit of the depositor and the bank resealed and handed to the owner for another accumulation. The bank is caught at the bottom in reassembling and secured at top by the setting of an eyelet, the bank having simple tools provided for the purpose. When used in this way the bank usually takes a round lot, having name and address on one side and the sentence, "You fill it; We open it," on the other

side, both inscriptions being stamped by the die. The bank is put up in a neat paper carton together with a small circular containing some simple directions.

The Emerson Alfalfa Harrow.

The Emerson Mfg. Company, Rockford, Ill., is offering the alfalfa harrow shown in the accompanying illustration. The construction of this harrow is such that the teeth not only destroy the weeds but split up the alfalfa stools, thoroughly loosening the soil to a depth of 3 to 6



The Emerson Alfalfa Harrow.

in., resulting in a decided increase in the yield from the start. More than this, it is remarked, the machine makes it possible to continue the alfalfa year after year, and saves all the expense of plowing up and reseeding, which has been found necessary in many sections, after four or five years continuous crop. Cleaners are provided when desired.

Safety Police Revolver.

The Hopkins & Allen Arms Company, Norwich, Conn., is placing on the market the new Safety Police revolver here illustrated. After firing the trigger is released and the hammer, working on its eccentric, rises instantly off the firing pin and rests safely against the solid steel frame. The hammer, it is explained, may be pounded purposely or accidentally, but nothing can get it on or near the firing pin until the trigger is again pulled. When the trigger is pulled it drives straight to the firing pin and delivers the full force of its blow without any striking lever or other interference to dull the force of the impact; therefore, there is no hanging or missing fire. A new feature is the solid locking joint. It has a solid post and back strap; the post and back strap retain their full original strength, and the dogs bite into the wedge-

Hopkins & Allen Safety Police Revolver.

shaped grooves in the post when the joint closes, giving a joint that is solid, strong and rigid. The revolver itself is well made and neatly finished in every way.

Angle Steel Sleds.

A one-piece arched bench with antifriction runners constitutes the leading feature of the line of children's sleighs, coasting sleds and bobs manufactured by the Angle Steel Sled Company, Kalamazoo, Mich. A half section of the arched bench is illustrated herewith. The runner consists of a specially rolled angle bar with a V-shaped projection extending laterally along the entire wearing surface of the runner. The one-piece bench is fastened to the angle runners without nails, screws or rivets in the bottom, being securely riveted through the vertical leg of the angle. The sleds are made entirely of

Fig. 1.—One-Piece Arched Sled Bench.

steel, except the top, which is of wood; and both in form of construction and weight, and in quality of material used are fitted for durable service. The finished sled shown in Fig. 2 is designated as No. 5 special, with fancy side railings, scrolls and arched front pieces. The elab-

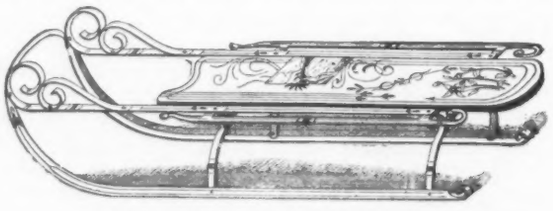
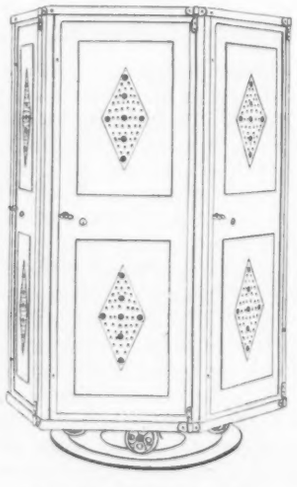


Fig. 2.—One of the Finished Sleds.

orate color schemes and decorations make the line especially attractive. Besides the regular line of sleds, the company also manufactures combination sled wagons, merry go-rounds, teeters, and steel specialties. The wagons are supplied with interchangeable wheels and bob runners, so that the wagon may be easily and conveniently changed to a sled.

Terrell's Hexagon Locker.

Terrell's Equipment Company, Grand Rapids, Mich., manufacturer of steel shelving, bins, &c., is placing on



Terrell's Hexagon Locker.

the market the metal locker shown herewith. It contains six compartments and works on a revolving device. It is particularly suitable for use in offices or other places where square lockers would appear commonplace. The locker can be placed in a corner or close against the wall and does not occupy more space than a square locker, while it has six compartments.

The Agrippa Forged Fittings Wrench.

J. H. Williams & Co., Brooklyn, N. Y., are putting on the market the fittings wrench shown herewith. It is wholly made of wrought steel, drop forged. The saw tempered jaw is permanently fastened in a milled pocket,

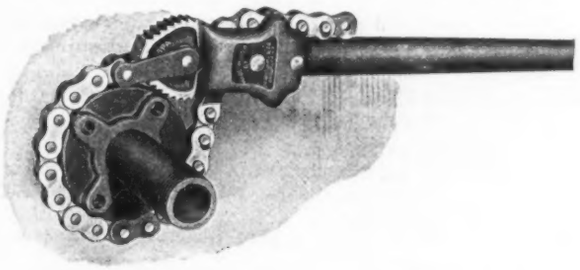


Fig. 1.—The Agrippa Drop Forged Fittings Wrench.

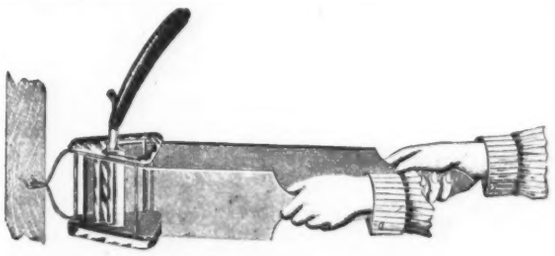
to a powerful solid forged steel handle. The chain is hand made and is longer than for pipe only. The chain swings from the center and can be used instantly with either side of the jaw. All parts of the wrench are interchangeable. As illustrated in Fig. 2, the wrench can be used in narrow places. It bites on irregular forms where a broader chain wrench might fail. The manufacturers

Fig. 2.—Agrippa Wrench in Use on Short Nipples.

remark that with this wrench no trouble will be experienced in handling short nipple and flange connections or jobs with a variety of outlets, there being a single, narrow, powerful jaw for both pipe and fittings. The wrench had been thoroughly tried for several years before placing it on the market.

The I-Must Strop Razor Strop.

The accompanying illustration represents a razor strop put on the market by the Crandall Cutlery Company, Bradford, Pa. The razor is held in a clutch which operates automatically when the strop is run through the machine, and the razor is brought against the strop at the proper angle. The strop is specially prepared by a patented process, which permits the use of one side for sharpening and the other side for finishing the razor up.



The I-Must-Strop Razor Strop.

The strop is said to operate with any style of razor, regardless of width, grind, point or length. It is stated that it is impossible to cut the strop. It is claimed to be of especial usefulness to the dealer in putting a razor, which he has just sold to a customer, in prime order in a moment, so that the first impression made upon the purchaser is favorable, and that it will usually result in selling a strop as well as a razor.

Little Gem Can and Bottle Opener.

The Taylor Mfg. Company, Hartford, Conn., manufacturer of tools, novelties, &c., is putting on the market the device here shown for opening cans, round or square, or removing tin caps from bottles. The blade is hardened so that it will last indefinitely, while the handle is long

Little Gem Can and Bottle Opener.

enough to give lots of power. The cutting edge is made of fine steel, carefully sharpened, and will work either way, right or left hand. The retail selling price of this combination tool is 10 cents.

PAINTS, OILS AND COLORS

Animal, Fish and Vegetable Oils—

	℔ gal	
Linseed, City, raw		@44
City, Boiled		@45
State and Western, raw		@40
Raw, Calcutta, in bbls		@..
Lard, Extra Prime, Winter		@77
Extra No. 1		@55
No. 1		@52
Cotton-seed, Crude, f.o.b. mills		@..
Summer Yellow, Prime		@.5
Summer White		@58
Yellow Winter		@59
Sperm, Crude		@60
Natural Winter		@73
Bleached Winter		@76
Bleached Winter, Extra		@..
Tallow, Prime		@61
Whale, Crude		@36
Natural Winter		@49
Bleached Winter		@51
Extra Bleached Winter		@53
Menhaden, Brown, Strained		@36
Light Strained		@36
Northern		@..
Southern		@..
Cocoanut, Ceylon	℔ lb	9½@ 9¾
Cochin	℔ lb	10 @10¼
Cod, Domestic, Prime		@38
Newfoundland		@42
Red, Elaine		@50
Saponified	℔ lb	7 @ 7¼
Olive, Italian, bbls, Yellow		@70
Neatsfoot, Prime		@57
Palm, Logos	℔ lb	7 @ 7¼

Mineral Oils—

	℔ gal.	
Black 29 gravity, 25@30 cold test		12½@13
29 gravity, 15 cold test		13 @13½
Summer		12 @12½
Cylinder, light filtered		19 @20
Dark, filtered		16½@17½
Paraffine, 903-907 gravity		14 @14½
903 gravity		13 @13½
883 gravity		10¾@11¼
Red		13 @14½

Miscellaneous—

Barytes:		
White, Foreign	℔ ton	$18.50@20.50
Amer, floated	℔ ton	19.00@20.00
Off color	℔ ton	13.00@16.50
Chalk, in bulk	℔ ton	3.00@ 3.25
In bbls	℔ 100 lb	@ .35
China Clay, Imported	℔ ton	11.00@17.50
Cobalt, Oxide	℔ 100 lb	2.50@ 2.60
Whiting, Commercial	℔ 100 lb	.43@ .52
Gilders	℔ 100 lb	.55@ .65
Ex. Gilders	℔ 100 lb	.60@ .65

Putty, Commercial—℔ 100 lb

In bladders	$1.75 @1.85
In bbls, or tubs	1.20 @1.45
In 1 lb to 5 lb cans	2.65 @2.95
In 12½ to 50 lb cans	1.50 @1.90

Spirits Turpentine—℔ gal.

In Oil bbls	59 @59½
In machine bbls	59½@60

Glue—

	℔ lb	
Cabinet		@15
Common Bone		7½@ 9
Extra White		@24
Foot Stock, White		@14
Foot Stock, Brown		@11
German Hide		@18
French		@40
Irish		@16
Low Grade		@12
Medium White		@17

Gum Shellac—

	℔ lb	
Bleached, Commercial		@43
Bone Dry		@52
Button		@50
Diamond I		@59
Fine Orange		@57
A. C, Garnet		@46
G. A. L		@41
Kala Button		@33
D. C		@63
Octagon B		@57
T. N		@43
V. S. O		@59

Colors in Oil—

	℔ lb	
Black, Lampblack		@14
Blue, Chinese		@46
Blue, Prussian		@36
Blue, Ultramarine		@46
Brown, Vandyke		@14
Green, Chrome		@16
Green, Paris		@24
Sienna, Raw		@15
Sienna, Burnt		@15
Umber, Raw		@14
Umber, Burnt		@14

White Lead, Zinc, &c.—

	℔ lb	
Lead, English white, in Oil		10½@10⅝
Lead, American White:		
Lots of 500 lb or over, in Oil		@ 7½
Lots less than 500 lb, in Oil		@ 8
Lead, White, in oil, 25 lb tin pails, add to keg price		@ ⅛
Lead, White, in oil, 12½ lb tin pails, add to keg price		@ 1
Lead, White, in oil, 1 to 5 lb ass'ted tins, add to keg price		@ 1½

Lead, American, Terms: For lots 12 tons and over ¼ ¢ rebate; and 2% for cash if paid in 15 days from date of invoice; for lots of 500 lbs. and over 2% for cash if paid in 15 days from date of invoice, for lots of less than 500 lbs. net.

	℔ lb	
Zinc, American, dry		5⅛@ 5½
Zinc, French:		
Antwerp, Red Seal, dry		8¾
Antwerp, Green Seal, dry		10¾
Paris, Red Seal, dry		9¾
Paris, Green Seal, dry		11

Zinc, V. M. French, in Poppy Oil:

Green Seal:	
Lots of 1 ton and over	13¼@13⅝
Lots of less than 1 ton	13⅜@13⅞

Zinc, V. M. French, in Poppy Oil:

Red Seal:	
Lots of 1 ton and over	11⅞@12⅜
Lots of less than 1 ton	12⅛@12⅝

Discounts.—French Zinc.—Discounts to buyers of 10 bbl. lots of one or mixed grades, 1%; 25 bbls., 2%; 50 bbls., 4%.

Dry Colors—

	℔ lb	
Black, Carbon		6¼@10
Black Drop, American		3½@ 8
Black Drop, English		5 @15
Black, Ivory		16 @20
Lamp, commercial		4 @ 6
Blue, Celestial		4 @ 6
Blue, Chinese		30 @33
Blue, Prussian		28 @32
Blue, Ultramarine		3½@15
Brown, Spanish		½@ 1
Carmine, No. 40		$3.10@3.25
Green, Chrome, ordinary		3½@ 5
Green, Chrome, pure		17 @25
Lead, Red, bbls., ½ bbls., kegs		@ 7¾
Litharge, bbls., ½ bbls., kegs		@ 7¾
Ocher, American	℔ ton	$8.50@16.00
American Golden		2½@ 3¼
French		1¾@ 2
Foreign Golden		3 @ 4
Orange Mineral, English		10 @12
French		11¾@12
German		10 @12
American		8¾@ 9
Red, Indian, English		4½@ 6
American		3 @ 3½
Red, Turkey, English		4 @10
Red, Tuscan, English		7 @10
Red, Venetian, Amer.	℔ 100 lb	$0.50@1.25
English	℔ 100 lb	$1.15@1.60
Sienna, Italian, Burnt and Powdered		3 @ 9
Italian, Raw, Powdered		3 @ 7
American, Raw		1½@ 2
American Burnt and Pow'd		1½@ 2
Talc, French	℔ ton	$18.00@25.00
American	℔ ton	15.00@25.00
Terra Alba, French	℔ 100 lb	.90@ 1.00
English	℔ 100 lb	.80@ 1.00
American	℔ 100 lb, No. 1	.75@ .80
American	℔ 100 lb, No. 2	.60@ .65
Umber, Turkey, Bnt. & Pow.		2 @ 3¼
Turkey, Raw and Powdered		2½@ 3½
Burnt, American		1½@ 2
Raw, American		1½@ 2
Yellow Chrome, Pure		12 @14
Vermilion, American Lead		7 @25
Quicksilver, bulk		65 @..
Quicksilver, bags		@64
English, Imported		65 @70
Chinese		$0.90@1.00

Current Hardware Prices.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33⅓ @ 33⅓ & 10% signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1907, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—"The Iron Age Standard Hardware Lists" contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—

Columbian and Domestic.....33⅓%
North's 10%
Zimmerman's—See Fasteners, Blind.

Window Stop—

Ives' Patent.....35%
Taplin's Perfection.....35%

Ammunition—See *Caps, Cartridges, Shells, &c.*

Anti-Rattlers—

Fernald Mfg. Co. Burton Anti-Rattlers, ₱ doz. pairs, Nos. 1, $0.75; 2, $0.60; 4, $1.00; 5, $0.50.
Fernald Quick Shifter, ₱ doz. pairs .....$2.00@$3.00

Anvils—American—

Eagle Anvils.....₱ lb @8½¢
Hay-Budden, Wrought.....9½@9¾¢
Trenton .....₱ lb 9½@9¾¢

Imported—

Peter Wright & Sons, ₱ lb, 84 to 349 lb, 11¢; 350 to 600 lb, 11½¢.

Anvil, Vise and Drill—

Millers Falls Co., $18.00.....15&10%

Apple Parers—See *Parers, Apple, &c.*

Aprons, Blacksmiths'—

Livingston Nail Co.....33⅓%

Augers and Bits—

Com. Double Spur....70&10@75%
Jennings' Patn., reg. finish....60&5@60&10%
Black Lip or Blued...65@65&5%
Boring Mach. Augers.....70%
Car Bits, 12-in. twist.....40&10%
Ford's Auger and Car Bits.....40&5%
Ft. Washington Auger Co., Conard's 30%
Forstner Pat. Auger Bits.....25%
C. E. Jennings & Co.:
No. 10 ext. lip, R. Jennings' list, 25&7½%
No. 30, R. Jennings' list.....50%
Russell Jennings'.....25&10&2½%
L'Hommedieu Car Bits.....15%
Mayhew's Countersink Bits.....45%
Pugh's Black.....20%
Pugh's Jennings' Pattern.....35%
Snell's Auger Bits.....60%
Snell's Bell Hangers' Bits.....60%
Snell's Car Bits, 12-in. twist.....60%
Snell's King Auger Bits.....50%
Wright's Jennings' Bits.....50%

Bit Stock Drills—

See *Drills, Twist.*

Expansive Bits—

Clark's Pattern, No. 1, ₱ doz. $26; No. 2, $18.....60&10%
Ford's, Clark's Pattern.....60%&5%
C. E. Jennings & Co., Steer's Pat..25%
Lavigne Pat., small size, $18.00; large size, $26.00.....60&10%
Swan's 60%

Gimlet Bits—

Per gro.
Common Dble. Cut....$3.00@3.25
German Pattern, Nos. 1 to 10, $4.75; 11 to 13, $5.75

Hollow Augers—

Bonney Pat., per doz..$6.50@7.00
Ames .....25&10%
Universal 20%

Ship Augers and Bits—

Ship Augers.....40&10%
Ford's .....33⅓&5%
C. E. Jennings & Co.:
L'Hommedieu's 6%
Watrous' .....33⅓&7½
Snell's 60%

Awl Hafts—See *Handles, Mechanics' Tool.*

Awls—

Brad Awls:
Handled .....gro. $2.75@3.00
Unhdled, Shldered..gro.63@66¢
Unhandled, Patent..gro.66@70¢
Peg Awls:
Unhandled, Patent..gro. 31@34¢
Unhdled, Shldered..gro. 65@70¢
Scratch Awls:
Handled, Com...gro. $3.50@4.00
Handled, Rocket..gro.$11.50@12.00

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—

Single Bit, base weights: Per doz.
First Quality.....$4.75@5.00
Second Quality.....$4.25@4.50
Double Bit, base weights:
First Quality.....$7.00@7.50
Second Quality.....$6.50@6.75

Axle Grease—

See *Grease, Axle*

Axles—Iron or Steel

Concord, Loose Collar..4½@5 ¢
Concord, Solid Collar...4¾@5¼¢
No. 1 Common, Loose....3¾@4½¢
No. 1½ Com., New Style..4½@5 ¢
No. 2 Solid Collar.....4½@5 ¢
Half Patent:
Nos. 7, 8, 11 and 12.....60@63%
Nos. 13 to 14.....60&65%
Nos. 15 to 18.....65&70%
Nos. 19 to 22.....65@70%

Boxes, Axle—

Common and Concord, not turned lb., 4½@5¢
Common and Concord, turned, lb., 5½@6¢
Half Patent.....lb., 9½@10¢

Bait—Fishing—

Hendryx:
A Bait.....20%
B Bait.....25%
Competitor Bait.....20&5%

Balances—Sash—

Caldwell new list.....50%
Pullman .....50&10@60%

Spring—

Spring Balances.....50&10@60%
Chattillon's:
Light Spg. Balances.....50@50&10%
Straight Balances.....40@40&10%
Circular Balances.....50&10%
Large Dial.....30%

Barb Wire—See *Wire, Barb.*

Bars—Crow—

Steel Crowbars, 10 to 40 lb.... per lb., 2¾@3¢

Towel—

No. 10 Ideal, Nickel Plate..₱ gro. $8.50

Beams, Scale—

Scale Beams.....40%
Chattillon's No. 1.....30%
Chattillon's No. 2.....40%

Beaters, Carpet—

Holt-Lyon Co.:
No. 12 Wire Coppered ₱ doz. $0.80; Tinned $0.85
No. 11 Wire Coppered ₱ doz. $1.15; Tinned $1.20
No. 10 Wire Tinned.....₱ doz. $1.50

Beaters, Egg—

Holt-Lyon Co.:
Holt, per doz., No. 5, Jap'd, $0.80; No. A, Jap'd, $1.15; No. B, Jap'd, $1.85; No. 6, Jap'd, $1.65.
Lyon, Jap'd, per doz., No. 2, $1.35.
Taplin Mfg. Co.:
Improved Dover, per gro., No. 60, $6.00; No. 75, $6.50; No. 100, $7.00; No. 102, Tin'd, $8.50; No. 150, Hotel, $15.00; No. 152, Hotel Tin'd, $17.00; No. 220, Tumbler, $8.50; No. 202, Tumbler Tin'd, $9.50; No. 300, Mammoth, per doz., $25.00.
Turner & Seymour Mfg. Co.:
T. & S. Dover.....$6.50

Bellows—

Blacksmith, Standard List..
Split Leather.....60&10@65%
Grain Leather.....50@50&10%

Hand—

	6	7	8	9	10	Net Prices.
Inch..						
Doz..	*$5.00*	*5.50*	*6.00*	*6.50*	*7.50*	

Molders—

	10	12	14	16	Net Prices.
Inch..					
Doz..	*$7.50*	*9.60*	*12.00*	*15.00*	

Bells—Cow—

Ordinary Goods...75&5@75&10&5%
High grade.....70&10@75%
Jersey .....75&10%
Texas Star.....50%

Door—

Home, R. & E. Mfg. Co.'s.....55&10%

Hand—

Polished, Brass.....50@50&10%
White Metal.....50@50&5%
Nickel Plated.....40&10@50%
Swiss .....50&10@50&10&5%
Cone's Globe Hand Bells.....33⅓@35%

Miscellaneous—

Farm Bells.....lb., 2¼@2½¢
Church and School....60@60&5%

Belting—Leather—

Extra Heavy, Short Lap..60&5%
Regular Short Lap....60&10&5%
Standard .....70&5%
Light Standard.....75%
Cut Leather Lacing.....40&5%
Leather Lacing Sides, per sq. ft. 25¢

Rubber—

Agricultural (Low Grade)..... 75@75&5%
Common Standard....70@70&10%
Standard .....70@70&5%
Extra .....60&5@60&10%
High Grade.....50&5@50&10%

Bench Stops—

See *Stops, Bench*

Benders and Upsetters, Tire—

Green River Tire Benders and Upsetters 20%

Bicycle Goods—

John S. Leng's Son & Co.'s 1907 list:
Chain, Parts, Spokes.....50%
Tubes 60%

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

Blocks—Tackle—

Common Wooden.....75%
B. & L. B. Co.:
Boston Wood Snatch, 50%; Eclipse Steel, 75%; Hollow Steel, 50&10%; Star Wire Rope, 50%; Tarbox Metal Snatch, 50%; Tarbox New Style Steel, 50&10%; Wire Rope Snatch, 50%.
Lane's Patent Automatic Lock and Junior 30%
See also Machines, Hoisting.

Boards, Stove—

Paper and Wood Lined.....40%
Embossed 50%

Boards, Wash—

See *Washboards.*

Bobs, Plumb—

Keuffel & Esser Co.....33⅓%

Bolts—

Carriage, Machine, &c.—

Common Carriage (cut thread):
⅝ × 6 and smaller...70&5@...%
Larger and Longer..60&2½@...%
Phila. Eagle $3.00 list May 21, '99 80%
Bolt Ends.....65@65&5%
Machine (cut thread):
⅜ × 4 and smaller..70&7½@...%
Larger and longer..60&7½@...%

Door and Shutter—

Cast Iron Barrel, Japanned, Round Brass Knob:

	3	4	5	6	8
Inch....					
Per doz.	*$0.30*	*.35*	*.45*	*.60*	*.80*

Cast Iron Spring Foot, Jap'd:

	6	8	10
Inch.....			
Per doz.....	*$1.20*	*1.50*	*2.25*

Cast Iron Chain, Flat, Japanned:

	6	8	10
Inch.....			
Per doz.....	*$1.00*	*1.40*	*1.65*

Cast Iron Flat Shutter, Jap'd., Brass Knobs:

	6	8	10
Inch.....			
Per doz.....	*$0.75*	*.95*	*1.25*

Wrought Barrel Japd..80@80&10%
Barrel Bronzed.....60&10%
Spring .....70&10@70&10&10%
Shutter .....50&5@50&10&5%
Square Neck.....75@75&10%
Square .....70&10&10%
Ives' Patent Door.....55%
Ives' Wrought Metal.....45%

Expansion—

Richards Mfg. Co.....50&10%

Plow and Stove—

Plow .....65&5@—%
Stove .....85@85&5%

Tire—

Common Iron.....80%
Norway Iron.....80%
American Screw Company:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84....82½%
Bay State, list Dec. 28, '99.....80%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84....82½%
Eclipse, list Dec. 28, '99.....80%
Russell, Burdsall & Ward Bolt & Nut Co.:
Empire, list Dec. 28, '99.....80%
Norway Phila., list Oct., '84 80%
Eagle 82½%
Shelton Co.:
Tiger Brand, list Dec. 28, '99....80%
Phila., Eagle, list Oct. 16, 1884..82½%
Upson Nut Co.:
Tire Bolts.....72½%

Borers, Bung—

Borers Bung, Ring, with Handle:

	1¼	1½	1¾	2
Inch.....				
Per doz...	*$4.80*	*5.60*	*6.40*	*8.00*
Inch	*2¼*			*2½*
Per doz.....	*$6.65*			*11.50*

Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.75; No. 3, $2.50 each.....25%

Boxes, Mitre—

C. E. Jennings & Co.....25%
Langdon, New Langdon and Langdon Improved, 20&10%; Langdon Acme .....15&10%
Perfection 40%
Seavey 45%

Braces—

Common Ball, American....$1.50
Barber's .....50&10&10@60&10%
Fray's Genuine Spofford's.....60%
Fray's No. 70 to 120, 81 to 123, 207 to 414 .....60%
C. E. Jennings & Co.....50&5%
Mayhew's Ratchet.....60%
Mayhew's Quick Action Hay Pat...50%
Millers Falls Drill Braces.....25&10%
P., S. & W. Co., Peck's Pat..60&10%

Brackets—

Wrought Steel.....70&10@75&10%
Bradley Metal Clasp..80&10@80&10&5%
Griffin's Pressed Steel.....75@75&10%
Griffin's Folding Brackets.....70&10%
Taplin Victor Handy Egg Beater Bracket .....₱ doz. $1.50

Bright Wire Goods—See *Wire and Wire Goods.*

Broilers—

Kilbourne Mfg. Co.....75&20%
Wire Goods Co.....75%

Buckets, Galvanized—

M'f'gr's list, price per gross.

	Quart.	10	12	14	
Water, Reg...	*25.35*	*28.00*	*32.00*		24 & 10&5%
Water, Hvy...	*45.35*	*48.00*	*52.00*		
Fire, Rd. Btm.	*32.00*	*34.65*	*38.65*		
Well	*37.85*	*41.35*	*45.35*		

Bull Rings—See *Rings, Bull*

Butts—Brass—

Wrought, High List, Oct. 26, '06. 45@45&10%
Cast Brass, Tiebout's.....40%

Cast Iron—

Fast Joint, Broad....40&10@50%
Fast Joint, Narrow...40&10@50%
Loose Joint.....70&10@75%
Loose Pin.....70&10@75%
Mayer's Hinges.....70@70&5
Parliament Butts.....70@70&5

Wrought Steel—Discount.

Reversible and Broad.....70&5%
Light Reversible, Light Narrow .....70&5%
Loose Joint, Narrow, Light Inside Blind, etc.....70%
Back Flaps, Table Chest....65%

Cages, Bird—

Hendryx Brass: Series 3000, 5000, 1100, net list; 1200, 15%; 200, 300, 900 .....30%

Hendryx Bronze; Series 700, 800..30%
Hendryx Enameled..35%

Calipers—See *Compasses.*

Calks, Toe and Heel—

Blunt, 1 prong, per lb., 4¼@4¾¢
Sharp, 1 prong, per lb., 4¾@5¼¢
Burke's, Blunt, 4@4¾¢; Sharp, 4½@5¼¢
Lautier, Blunt, 4@4¼¢; Sharp, 4½@4¾¢
Perkins', Blunt, ₱ lb, 3.65¢; Sharp, 4.15¢

Can Openers—

See *Openers, Can.*

Caps, Percussion—

Eley's E. B.....52@55¢
G. D.....*per M* 34@35¢
F. L.....*per M* 40@42¢
G. E.....*per M* 48@50¢
Musket.....*per M* 62@63¢

Primers—

Berdan Primers, $2 per M..20&5%
Primer Shells and Bullets..15&10%
All other primers per M.$1.52@1.60

Carpet Stretchers—

See *Stretchers, Carpet.*

Cartridges—

Blank Cartridges:

32 C. F., $5.50.....10&5%
38 C. F., $7.00.....10&5%
22 cal. Rim, $1.50.....10&5%
32 cal. Rim, $2.75.....10&5%
B. B. Caps, Con. Ball, Sicgd.$1.90
B. B. Caps, Round Ball....$1.49
Central Fire.....25%
Target and Sporting Rifle..15&5%
Primed Shells and Bullets.15&10%
Rim Fire, Sporting.....50%
Rim Fire, Military.....15&5%

Casters—

Bed.....65&10%
Plate.....60&5%
Philadelphia.....70&10%
Acme, Ball Bearing.....30%
Gem (Roller Bearing).....70&10&10&5%
Steel Gem.....20%
Standard Ball Bearing.....45%
Yale (Double Wheel) low list..40&10%

Cattle Leaders—

See *Leaders, Cattle.*

Chain, Proof Coil—

American Coil, Straight Link:

5-16	¼	*5-16*	⅜	*7-16*	½	*9-16*
$8.77	6.17	5.02	4.57	4.37	4.27	4.22

⅝ ¾ ⅞ *to 1* 1⅛ *to* 1¼ *inch.*
8¼.17 4.07 4.02 4.12
In cask lots, deduct 25¢.
German Coil.....60&10&10@70%

Halter—

Halter Chains.....60@60&5%
German Pattern Halter Chains, list July 24, '97.....60&10&5%
Covert Mfg. Co.
Halter.....35&5%

Cow Ties—

See *Halters and Ties.*

Trace, Wagon, &c.—

Traces, Western Standard: 100 pr.
6½—6-3, Straight, with ring.$28.00
6½—6-2, Straight, with ring.$29.00
6½—8-2, Straight, with ring.$32.00
6½—10-2, Str'ght, with ring.$37.00

NOTE—*Add 2c per pair for Hooks. Twist Traces; add per pair for Nos. 2 and 3, 2c; No. 1, 3c; No. 0, 4c to price of Straight Link.*

Eastern Standard Traces, Wagon Chain, &c.....60%

Miscellaneous—

Jack Chain, list July 10, '93:
Iron.....60&10%
Brass.....50&10%
Safety and Plumbers' Chain, 60&10%
Gal. Pump Chain....*lb*.4½@4¾%
Covert Mfg. Co.:
Breast, Halter, Heel, Rein, Stallion.....40%
Oneida Community:
American Halter, Dog and Kennel Chains.....35&2½@40%
Niagara Dog Leads and Kennel Chains.....45@50&5%
Wire Goods Co.:
Dog Chain.....70%
Universal Dbl.-Jointed Chain.....50%

Chain and Ribbon, Sash—

Oneida Community:
Steel Chain.....60%
Pullman:
Bronze Chain, 60%; Steel Chain, 60&10%
Sash Chain Attachments, per set..8¢
Aluminoy Sash Ribbon, per 100 ft.....$1.25@3.00
Sash Ribbon Attachments, per set.8¢

Chalk—(From Jobbers.)

Carpenters' Blue....*gro.*, 50@55¢
Carpenters' Red.....*gro.*, 45@50¢
Carpenters' White...*gro.*, 40@45¢

Checks, Door—

Bardsley's.....48%
Pullman, per gro.....$54.00
Ruswin.....33⅓%

Chests, Tool—

American Tool Chest Co.:
Boys' Chests, with Tools.....50%
Youths' Chests, with Tools.....25%
Gentlemen's Chests, with Tools..25%
Farmers', Carpenters,' etc., Chests, with Tools.....20%
Machinists' and Pipe Fitters' Chests, Empty.....45%
Tool Cabinets.....45%
C. E. Jennings & Co.'s Machinists' Tool Chests.....7½%

Chisels—Socket Framing and Firmer

Standard List.....70&10@75%
Buck Bros.....30%
C. E. Jennings & Co.:
Socket Firmer No. 10.....25&7½%
Socket Framing No. 15.....25&7½%
Swan's.....66⅔@70%
L. & I. J. White Co.....30@30&5%

Tanged—

Tanged Firmers.....30&5@35%
Buck Bros.....30%
C. E. Jennings & Co. Nos. 191, 181..25%
L. & I. J. White Co.....25&5%

Cold—

lb.
Cold Chisels, good quality..15@15¢
Cold Chisels, fair quality..11@12¢
Cold Chisels, ordinary... 9@10¢

Chucks—

Almond Drill Chucks.....35%
Almond Turret Six-Tool Chuck....40%
Beach Pat., each $8.00.....35&5%
Empire.....25%
Blacksmiths'.....25%
Jacobs' Drill Chucks.....35%
Pratt's Positive Drive.....25%
Skinner Patent Chucks:
Independent Lathe Chucks.....35%
Universal, Reversible Jaws.....35%
Combination, Reversible Jaws....35%
Drill Chucks, New Model, 25%; Standard, 45%; Skinner Pat., 25%; Positive Drive.....40%
Planer Chucks.....20%
Face Plate Jaws.....35%
Standard Tool Co.:
Improved Drill Chuck.....45%
Union Mfg. Co.:
Combination, Nos. 1, 2, 3, 4, 5, 6, 7, 8 and 17, 40%; No. 21.....35%
Scroll Combination, Nos. 83 and 84.....30%
Geared Scroll, Nos. 33, 34 and 35..25%
Independent Iron, Nos. 18 and 318.35%
Independent Steel, No. 64.....25%
Union Drill, Nos. 000, 00, 100, 101, 102, 103, 104.....35%
Union Czar Drill.....25%
Universal, 11, 12, 16, 17, 13, 14, 15..40%
Universal, No. 42.....35%
Iron Face Plate Jaws, Nos. 28, 30, 48 and 50.....35%
Steel Face Plate Jaws, Nos. 70 and 72.....30%
Westcott Patent Chucks:
Lathe Chucks.....50%
Little Giant Auxiliary Drill.....50%
Little Giant Double Grip Drill..50%
Little Giant Drill, Improved.....50%
Oneida Drill.....50%
Scroll Combination Lathe.....50%

Clamps—

Adjustable, Hammers'.....20@20&5%
Carriage Makers', P., S. & W. Co.....50&10%
Besly, Parallel.....33⅓&10%
Myers' Hay Rack.....45%
Lineman's Swedish Neverturn.....65%
Wood Workers, Hammers'.....40&10%
Saw Clamps, see Vises, Saw Filers'.

Cleaners, Drain—

Iwan's Champion, Adjustable.....50%
Iwan's Champion, Stationary.....40%

Sidewalk—

Star Socket, All Steel, ₱ doz. $4.05 net
Star Shank, All Steel, ₱ doz. $3.24 net
W. & C. Shank, All Steel, ₱ doz., 7½ in., $3.00; 8 in., $3.25.

Cleavers, Butchers'—

Foster Bros.....30%
Fayette R. Plumb.....30%
L. & I. J. White Co.....30%

Clippers, Horse and Sheep—

Chicago Flexible Shaft Company:
1902 Chicago Horse, each..$10.75
20th Century Horse, each..$5.00
Lightning Belt Horse, each.$15.00
Chicago Belt Horse, each.$20.00
Stewart's Enclosed Gear Horse, each.....$4.75
Stewart's Patent Sheep Shearing Machine, each.....$12.75
Stewart Enclosed Gear Shearing Machine, No. 8, each..$9.75

} 25% off

Clips, Axle—

Regular Styles, list July 1, '05, 80&60&10%

Cloth and Netting, Wire—See *Wire, &c.*

Cocks, Brass—

Hardware list:
Plain Bibbs, Globe, Kerosene, Racking, Liquor, Bottling, &c.....60&10@65%
Compression Bibbs...55&10@60%

Coffee Mills—

See *Mills, Coffee.*

Collars, Dog—

Nickel Chain, Walter B. Stevens & Son's list.....40%
Leather, Walter B. Stevens & Son's list.....40%

Compasses, Dividers, &c.

Ordinary Goods.....70&10@75%
Wm. Schollhorn Co.:
Excelsior Dividers.....60%
Lodi Dividers.....70&10%

Conductor Pipe,—

L. C. L. to Dealers:

Galvanized			
Galv. Steel.	*Charcoal Iron.*	*Copper. 14, 16&20 oz.*	
Eastern:			
70%	50&17½%	30&10%	
Central:			
70&5%	60%	30&10%	
Western and Southern:			
70%	55&5%	30&7½%	
So. Western			
65&5%	50&5%	30&5%	

Terms, 60 *days*; 2% *cash* 10 *days. Factory shipments generally delivered.*

See also Eave Troughs.

Coolers, Water—

L. & G. Mfg. Co.:

Gal.	2	3	4	6	8
Galvanized, ea.	$1.85	$2.00	$2.25	$2.90	$3.90
Galvanized, Lined, side handles,					
Gal.	2	3	4	6	8
Each	$1.95	$2.15	$2.40	$3.30	$4.15

White Enameled.....10%
Agate Lined.....10%

Coopers' Tools—See *Tools, Coopers'.*

Coppers' Soldering—

Soldering Coppers, 3 lbs. to pair and heavier, 30@33¢; lighter than 3 lb. to pair.....32@35¢

Cord—Sash—

Braided, Drab.....*lb.* 35¢
Braided, White, Com., Nos. 8 to 12, 26¢; No. 7, 26½¢; No. 6, 27½¢.
Cable Laid Italian, lb., No. 18..37¢
Italian, lb., A, No. 18, 25¢; B, 22¢
Common India.....*lb.*, 11@11½¢
Cotton Sash Cord, Tw'ted.18@20¢
Patent Russia.....*lb*...20¢
Cable Laid Russia.....*lb*...21¢
India Hemp, Br'd'd.....*lb*...21¢
India Hemp, Twisted..*lb*.13@14¢
Patent India, Twisted...*lb*...17¢
Pearl Braided, cotton, No. 6, ₱ lb, 27½¢; No. 7, 26½¢; Nos. 8 to 12, 26¢
Eddystone, Braided, Nos. 8 to 12, 26¢; 7, 26½¢; 6, 27½¢.
Harmony Cable Laid Italian, Nos. 7 to 10.....₱ lb 23 ¢
Pullman:
Wire Sash Cord.....10%
Sash Cord Attachments, per doz.10¢
Samson, Nos. 8 to 12:
Braided, ₱ lb., Drab Cotton, 55¢; Italian Hemp, 40¢@50¢; Linen, 65¢; White Cotton, 50¢; Spot Cord.....50¢
Massachusetts, White....₱ lb 40¢
Massachusetts, Drab.....₱ lb 45¢
Phoenix, White, Nos. 8 to 12, 27¢;
Silver Lake, per lb.:
A, Drab, 45¢; A, White, 40¢;
B, Drab, 40¢; B, White, 35¢;
Italian Hemp, 40¢; Linen....57½¢
See also Chain and Ribbon.

} 15%

Wire, Picture—

List July 10, 1906.....90@—%
Hendryx Standard Wire Picture Cord, old list, 85&10%
Turner & Stanton Co. Wire Picture Cord.....85&10%

Cradles—

Grain.....40&12½%

Crayons—

White Round Crayons, Cases, 100 gro., $6.50@$7.50 at factory, but lower prices made by jobbers
Zelnicker's Lumber.....₱ gro.
White and Purple, Indelible....$7.50
Blue, Red, Green, Yellow and Terra Cotta, $6.50; Black.....$4.00
Giant Lumber, 5¼ in. x 15-16 in. round, all colors, $16.25; Indelibles.....$18.75
Genuine Soapstone, Metal Workers', 5 in. x ¼ in. Round, $2.50; 5 in. x ¼ in. Square, $1.75; 5 x ½ x 3-16, $2.50; 5 x 1¼ x 3-16.....$3.00

Crooks, Shepherds'—

Fort Madison, per doz., Heavy, $5.50; Light.....$5.00

Crow Bars—See *Bars, Crow.*

Cultivators—

Victor Garden.....50%

Cutlery, Table—

International Silver Company:
No. 12 M'd'm Knives, 1847, ₱ doz. $3.50
Star, Eagle, Rogers & Hamilton and Anchor.....₱ doz. $3.00
Wm. Rogers & Son.....₱ doz. $2.50

Cutters—Glass—

H. H. Mayhew Co.....40%
Red Devil.....60%
B. Mfg. Co.....40%
Woodward.....50%

Meat and Food—

American.....30%

Nos.	401	402	403	404	405	406	407
Each	$5	$7	$10	$12	$25	$50	$60

Enterprise:

Nos.	5	10	12	22	32
Each	$2	$3	$2.75	$4.50	$6

25@25&7½%
No. 202, $1.50.....40&7½%
P., S. & W. Co.:
Dixon's.....₱ doz. 33⅓%

Nos.	1	2	3	4
	$14.00	$17.00	$19.00	$30.00

Ideal.....40@40&5%
Hales.....60&10&5%
Little Giant.....₱ doz. 40@50%

Nos.	305	310	312	320	322
	$35.00	$48.00	$44.00	$72.00	$68.00

New Triumph No. 605, ₱ doz. $24.00, 40&10%
Ruswin Food, No. 1, $24.00; No. 2, $27.00.....45&10&10%

	$15.00 $18.00

Enterprise Beef Shavers.....25@30%

Slaw and Kraut—

Henry Disston & Sons:
Slaw and Kraut Cutters.....35%
Corn Graters.....30%
J. M. Mast Mfg. Co.:
Slaw Cutters, 1 Knife....₱ doz. $3.00
Combined Slaw Cutter and Corn Grater.....₱ doz. $4.00

Tobacco—

All Iron, Cheap..*doz.* $4.25@$4.50
Enterprise.....25@30%
National, ₱ doz., No. 1, $21; No. 2, $18.....40%

Diggers, Post Hole, &c.—

Disston's:
Rapid, ₱ doz., $24.00.....25%
Samson, ₱ doz., $34.00.....25%
Iwan's Improved Post Hole Auger..40%
Vaughan Pattern Post Hole Augers, ₱ doz., $7.00
Perfection Post Hole Diggers, ₱ doz.....$8.75
Split Handle Post Hole Diggers, ₱ doz., $7.75
Hercules Pattern, ₱ doz.....$10.00
Kohler's, ₱ doz., Universal, $15.00; Little Giant, $12.00; Hercules, $10.00; Invincible, $9.00; Rival, $8.50; Pioneer.....$7.50
Never-Break Post Hole Diggers, ₱ doz., $24.00.....60%

Dividers—See *Compasses.*

Drawing Knives—See *Knives, Drawing.*

Dressers, Emery Wheel—

Sterling Emery Wheel Dressers.....35%
Sterling Wheel Dresser Cutters.....35%

Drills and Drill Stocks—

Blacksmiths' Common Drilling Machines.....$1.50@$1.75
Breast, Millers Falls.....15&10%
Breast, P., S. & W.....33⅓%
Goodell Automatic Drills.50&10@60&10%
Millers Falls Automatic Drills.33⅓&10%
Ratchet, Curtis & Curtis.....25%
Ratchet, Parker's.....40%
Ratchet, Weston's.....40%
Ratchet, Weston's, Style H Improved.....40%
Ratchet, No. 012.....40%
Ratchet, Celebrated.....40%
Ratchet, Whitney's, P., S. & W.....50&5%
Whitney's Hand Drill, No. 1, $10.00; Adjustable, No. 10, $12.00.....33⅓%

Twist Drills—

Bit Stock.....60&10&10@70%
Taper and Straight Shank.....60&10@60&10&5%

Drivers, Screw—

Screw D'ver Bits, per doz.45@50¢
Balsey's Screw Holder and Driver, ₱ doz., 2½-in., $6; 4-in., $7.50; 6-in., ₱.....50%
Buck Bros.' Screw Driver Bits.....30%
Champion.....50%
Disston's.....70%
Fray's Hol. H'dle Sets, No. 3, $12..50%
Ford's Brace Screw Drivers....40&10%
Gay's Double Action Ratchet.....35%
Goodell's Auto.....65@65&10%
Mayhew's Black Handle.....40%
Mayhew's Monarch.....40%
Millers Falls, Nos. 20 and 21...25&10%
Millers Falls, Nos. 11, 12, 41, 42..15&10%
Smith & Hemenway Co., Neverturn, 66⅔%; Elmora, 60%; Star, 30&10%
Swan's:
Nos. 7565 to 7568, 50%; No. 7540, 40&10%

Eave Trough, Galvanized—

Territory.	*L. C. L. Galvanized*	
Galv. Steel.	*Charcoal Iron.*	*Copper. 14, 16&20 oz.*
Eastern:		
70&30%	70%	30&10%
Central:		
80%	70&5%	30&10%
Western and Southern:		
70&30%	70%	30&7½%
So. Western:		
75&7½%	65&5%	30&5%

Terms.—2% for cash. Factory shipments generally delivered.

See also Conductor Pipe and Elbows.

Elbows and Shoes—

Factory shipments, all territories:
Galv. Steel and Galv. C. I. Standard Gauge.....80%
No. 26.....50%
No. 24.....25%
No. 22.....10%
Copper.....40&10%

Elbows, Stove Pipe—

Edwards, Standard Blue.....40&10&10%
Edwards, Royal Blue.....40&10&10%
Reeves, Dover, one piece.....40&10%

Emery, Turkish—

	¼ to ½:	*5¼ to 220:*	*Flour.*
Kegs.....*lb.* 5	¢	5½¢	5¼¢
½ Kegs.....*lb.* 5¼	¢	5¾¢	5½¢
¼ Kegs.....*lb.* 5½	¢	6 ¢	5¾¢
10-lb. cans, 10 in case....6½	¢	7 ¢	6 ¢
10-lb. cans, less than 10..... 10	¢	10 ¢	6 ¢
Less quantity.. 10	¢	10 ¢	8 ¢

NOTE.—In lots 1 to 3 tons a discount of 10% is given.

Current Hardware Prices.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33⅓ @ 33⅓ & 10% signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1907, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—"The Iron Age Standard Hardware Lists" contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—

Columbian and Domestic.....33⅓%
North's 10%
Zimmerman's—See Fasteners, Blind.

Window Stop—

Ives' Patent.....35%
Taplin's Perfection.....30%

Ammunition— See *Caps, Cartridges, Shells, &c.*

Anti-Rattlers—

Fernald Mfg. Co. Burton Anti-Rattlers, ℔ doz. pairs, Nos. 1, $0.75; 2, $0.60; 4, $1.00; 5, $0.50.
Fernald Quick Shifter, ℔ doz. pairs .....$2.00@$3.00

Anvils—American—

Eagle Anvils.....℔ lb @8½¢
Hay-Budden, Wrought.....9½@9¾¢
Trenton .....℔ lb 9½@9¾¢

Imported—

Peter Wright & Sons, ℔ lb, 84 to 349 lb, 11¢; 350 to 600 lb, 11½¢.

Anvil, Vise and Drill—

Millers Falls Co., $18.00.....15&10%

Apple Parers— See *Parers, Apple, &c.*

Aprons, Blacksmiths'—

Livingston Nail Co.....33⅓%

Augers and Bits—

Com. Double Spur....70&10@75%
Jennings' Patn., reg. finish....60&5@60&10%
Black Lip or Blued...65@65&5%
Boring Mach. Augers.....70%
Car Bits, 12-in. twist.....40&10%
Ford's Auger and Car Bits.....40&5%
Ft. Washington Auger Co., Conard's 35%
Forstner Pat. Auger Bits.....25%
C. E. Jennings & Co.:
No. 10 ext. lip, R. Jennings' list, 25&7½%
No. 30, R. Jennings' list.....50%
Russell Jennings'.....25&10&2½%
L'Hommedieu Car Bits.....15%
Mayhew's Countersink Bits.....45%
Pugh's Black.....20%
Pugh's Jennings' Pattern.....35%
Snell's Auger Bits.....60%
Snell's Bell Hangers' Bits.....60%
Snell's Car Bits, 12-in. twist.....60%
Snell's King Auger Bits.....50%
Wright's Jennings' Bits.....50%

Bit Stock Drills—

See *Drills, Twist.*

Expansive Bits—

Clark's Pattern, No. 1, ℔ doz. $26; No. 2, $18.....60&10%
Ford's, Clark's Pattern.....66⅔&5%
C. E. Jennings & Co., Steer's Pat..25%
Lavigne Pat., small size, $18.00; large size, $26.00.....60&10%
Swan's 60%

Gimlet Bits—

Per gro.
Common Dble. Cut....$3.00@3.25
German Pattern, Nos. 1 to 10, $4.75; 11 to 13, $5.75

Hollow Augers—

Bonney Pat., per doz..$6.50@7.00
Ames .....25&10%
Universal 20%

Ship Augers and Bits—

Ship Augers.....40&10%
Ford's .....33⅓&5%
C. E. Jennings & Co.:
L'Hommedieu's 6%
Watrous' .....33⅓&7½
Snell's 40%

Awl Hafts—See *Handles, Mechanics' Tool.*

Awls—

Brad Awls:
Handled .....gro. $2.75@3.00
Unhdled, Shldered...gro.63@66¢
Unhandled, Patent..gro.66@70¢
Peg Awls:
Unhandled, Patent..gro. $1@3¼¢
Unhdled, Shldered..gro. 65@70¢
Scratch Awls:
Handled, Com...gro. $3.50@4.00
Handled, Socket..gro.$11.50@12.00

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—

Single Bit, base weights: Per doz.
First Quality.....$4.75@5.00
Second Quality.....$4.25@4.50
Double Bit, base weights:
First Quality.....$7.00@7.50
Second Quality.....$6.50@6.75

Axle Grease—

See *Grease, Axle*

Axles— *Iron or Steel*

Concord, Loose Collar..4½@5 ¢
Concord, Solid Collar...4¾@5¼¢
No. 1 Common, Loose....3¾@4¼¢
No. 1½ Com., New Style..4½@5 ¢
No. 2 Solid Collar.....4½@5 ¢
Half Patent:
Nos. 7, 8, 11 and 12.....60@65%
Nos. 13 to 14.....60@65%
Nos. 15 to 18.....65@70%
Nos. 19 to 22.....65@70%

Boxes, Axle—

Common and Concord, not turned lb., 4½@5¢
Common and Concord, turned. lb., 5½@6¢
Half Patent.....lb., 9½@10¢

Bait— Fishing—

Hendryx:
A Bait.....20%
B Bait.....25%
Competitor Bait.....20&5%

Balances— Sash—

Caldwell new list.....50%
Pullman .....50&10@60%

Spring—

Spring Balances.....50&10@60%
Chatillon's:
Light Spg. Balances.....50@50&10%
Straight Balances.....40@40&10%
Circular Balances.....50&10%
Large Dial.....30%

Barb Wire—See *Wire, Barb.*

Bars— Crow—

Steel Crowbars, 10 to 40 lb.... per lb., 2¾@3¢

Towel -

No. 10 Ideal, Nickel Plate..℔ gro. $8.50

Beams, Scale—

Scale Beams.....40%
Chattillon's No. 1.....30%
Chattillon's No. 2.....40%

Beaters, Carpet—

Holt-Lyon Co.:
No. 12 Wire Coppered ℔ doz. $0.80; Tinned $0.85
No. 11 Wire Coppered ℔ doz. $1.15; Tinned $1.20
No. 10 Wire Tinned.....℔ doz. $1.50

Beaters, Egg-

Holt-Lyon Co.:
Holt, per doz., No. 5, Jap'd, $0.80; No. A, Jap'd, $1.15; No. B, Jap'd, $1.85; No. 6, Jap'd, $1.65, Lyon, Jap'd, per doz., No. 2, $1.35.
Taplin Mfg. Co.:
Improved Dover, per gro., No. 60, $6.00; No. 75, $6.50; No. 100, $7.00; No. 102, Tin'd, $8.50; No. 150, Hotel, $15.00; No. 152, Hotel Tin'd, $17.00; No. 200, Tumbler, $8.50; No. 202, Tumbler Tin'd, $9.50; No. 300, Mammoth, per doz., $25.00.
Turner & Seymour Mfg. Co.:
T. & S. Dover.....$6.50

Bellows—

Blacksmith, Standard List..
Split Leather.....60&10@65%
Grain Leather.....50@50&10%

Hand—

Inch..	*6*	*7*	*8*	*9*	*10*
Doz..	*$5.00*	*5.50*	*6.00*	*6.50*	*7.50*

Molders—

Inch..	*10*	*12*	*14*	*16*
Doz..	*$7.50*	*9.00*	*12.00*	*15.00*

Net Prices.

Bells— Cow—

Ordinary Goods..75&5@75&10&5%
High grade.....70&10@75%
Jersey .....75&10%
Texas Star.....50%

Door—

Home, R. & E. Mfg. Co.'s.....55&10%

Hand—

Polished, Brass.....50@50&10%
White Metal.....50@50&5%
Nickel Plated.....40&10@50%
Swiss .....50&10@50&10&5%
Cone's Globe Hand Bells.....33⅓@35%

Miscellaneous—

Farm Bells.....lb., 2¼@2½¢
Church and School....60@60&5%

Belting— Leather—

Extra Heavy, Short Lap..60&5%
Regular Short Lap....60&10&5%
Standard .....70&5%
Light Standard.....75%
Cut Leather Lacing.....40&5%
Leather Lacing Sides, per sq. ft. 25¢

Rubber—

Agricultural (Low Grade).... 75@75&5%
Common Standard....70@70&10%
Standard .....70@70&5%
Extra .....60&5@60&10%
High Grade.....50&5@50&10%

Bench Stops—

See *Stops, Bench*

Benders and Upsetters, Tire—

Green River Tire Benders and Upsetters 20%

Bicycle Goods—

John S. Leng's Son & Co.'s 1907 list: Chain, Parts, Spokes.....50%
Tubes 60%

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

Blocks— Tackle—

Common Wooden.....75%
B. & L. B. Co.:
Boston Wood Snatch, 50%; Eclipse Steel, 75%; Hollow Steel, 50&10%; Star Wire Rope, 50%; Tarbox Metal Snatch, 50%; Tarbox New Style Steel, 50&10%; Wire Rope Snatch, 50%.
Lane's Patent Automatic Lock and Junior 30%
See also Machines, Hoisting.

Boards, Stove—

Paper and Wood Lined.....40%
Embossed 50%

Boards, Wash—

See *Washboards.*

Bobs, Plumb—

Keuffel & Esser Co.....33⅓%

Bolts—

Carriage, Machine, &c.—

Common Carriage (cut thread):
⅝ × 6 and smaller...70&5@...%
Larger and Longer..60&2½@—%
Phila. Eagle $3.00 list May 21, '99 80%
Bolt Ends.....65@65&5%
Machine (cut thread):
⅝ × 4 and smaller..70&7½@—%
Larger and longer..60&7½@—%

Door and Shutter—

Cast Iron Barrel, Japanned, Round Brass Knob:

Inch....	*3*	*4*	*5*	*6*	*8*
Per doz..	*$0.30*	*.35*	*.45*	*.60*	*.80*

Cast Iron Spring Foot, Jap'd:

Inch	*6*	*8*	*10*
Per doz.....	*$1.20*	*1.50*	*2.25*

Cast Iron Chain, Flat, Japanned:

Inch.....	*6*	*8*	*10*
Per doz.....	*$1.00*	*1.40*	*1.65*

Cast Iron Flat Shutter, Jap'd., Brass Knobs:

Inch.....	*6*	*8*	*10*
Per doz.....	*$0.75*	*.95*	*1.25*

Wrought Barrel Japd..80@80&10%
Barrel Bronzed.....60&10%
Spring .....70&10@70&10&10%
Shutter .....50&5@50&10&5%
Square Neck.....75@75&10%
Square .....70&10&10%
Ives' Patent Door.....55%
Ives' Wrought Metal.....45%

Expansion—

Richards Mfg. Co.....50&10%

Plow and Stove—

Plow .....65&5@—%
Stove .....85@85&5%

Tire—

Common Iron.....80%
Norway Iron.....80%
American Screw Company:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84...82½%
Bay State, list Dec. 28, '99.....80%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84...82½%
Eclipse, list Dec. 28, '99.....80%
Russell, Burdsall & Ward Bolt & Nut Co.:
Empire, list Dec. 28, '99.....80%
Norway Phila., list Oct., '84 80%
Eagle 82½%
Shelton Co.:
Tiger Brand, list Dec. 28, '99.....80%
Phila., Eagle, list Oct, 16,1884..82½%
Upson Nut Co.:
Tire Bolts.....72½%

Borers, Bung—

Borers Bung, Ring, with Handle:

Inch.....	*1¼*	*1½*	*1¾*	*2*
Per doz...	*$4.80*	*5.60*	*6.40*	*8.00*
Inch	*2¼*		*2½*	
Per doz.....	*$5.65*		*11.50*	

Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.75; No. 3, $2.50 each.....25%

Boxes, Mitre—

C. E. Jennings & Co.....25%
Langdon, New Langdon and Langdon Improved, 20&10%; Langdon Acme .....15&10%
Perfection 40%
Seavey 45%

Braces—

Common Ball, American....$1.50
Barber's .....50&10&10@60&10%
Fray's Genuine Spofford's.....60%
Fray's No. 70 to 120, 81 to 123, 207 to 414 .....60%
C. E. Jennings & Co.....50&5%
Mayhew's Ratchet.....60%
Mayhew's Quick Action Hay Pat...50%
Millers Falls Drill Braces.....25&10%
P., S. & W. Co., Peck's Pat..60&10%

Brackets—

Wrought Steel.....70&10@75&10%
Bradley Metal Clasp..80&10@80&10&5%
Griffin's Pressed Steel.....75@75&10%
Griffin's Folding Brackets.....70&10%
Taplin Victor Handy Egg Beater Bracket .....℔ doz. $1.50

Bright Wire Goods—See *Wire and Wire Goods.*

Broilers—

Kilbourne Mfg. Co.....75&20%
Wire Goods Co.....75%

Buckets, Galvanized—

M'f'gr's list, price per gross.

	Quart	*12*	*14*	
Water, Reg...	*25.35*	*28.00*	*32.00*	*10&5%*
Water, Hvy...	*45.35*	*48.00*	*52.00*	
Fire, Rd. Btm:	*32.00*	*34.65*	*38.65*	
Well	*37.35*	*41.35*	*45.35*	

Bull Rings—See *Rings, Bull*

Butts— Brass—

Wrought, High List, Oct. 26, '06. 45@45&10%
Cast Brass, Tiebout's.....40%

Cast Iron—

Fast Joint, Broad....40&10@50%
Fast Joint, Narrow...40&10@50%
Loose Joint.....70&10@75%
Loose Pin.....70&10@75%
Mayer's Hinges.....70@70&5
Parliament Butts.....70@70&5

Wrought Steel— *Discount.*

Reversible and Broad.....70&5%
Light Reversible, Light Narrow .....70&5%
Loose Joint, Narrow, Light Inside Blind, etc.....70%
Back Flaps, Table Chest....65%

Cages, Bird—

Hendryx Brass: Series 3000, 5000, 1100, net list; 1200, 15%; 200, 300, 900 .....30%

Hendryx Bronze; Series 700, 800..30%
Hendryx Enameled..35%

Calipers—See *Compasses.*

Calks, Toe and Heel—

Blunt, 1 prong, per lb., 4¼@4¾¢
Sharp, 1 prong, per lb., 4¾@5¼¢
Burke's, Blunt, 4@4¾¢; Sharp, 4½@5¼¢
Lautier, Blunt, 4@4¾¢; Sharp, 4½@4¾¢
Perkins', Blunt, ℔ lb, 3.65¢; Sharp, 4.15¢

Can Openers—

See *Openers, Can.*

Caps, Percussion—

Eley's E. B.....52@55¢
G. D.....*per M* 34@35¢
F. L.....*per M* 40@42¢
G. E.....*per M* 48@50¢
Musket.....*per M* 62@63¢

Primers—

Berdan Primers, $2 per M..20&5%
Primer Shells and Bullets..15&10%
All other primers per M.$1.52@1.60

Carpet Stretchers—

See *Stretchers, Carpet.*

Cartridges—

Blank Cartridges:

32 C. F., $5.50.....10&5%
38 C. F., $7.00.....10&5%
22 cal. Rim, $1.50.....10&5%
32 cal. Rim, $2.75.....10&5%
B. B. Caps, Con. Ball, Swgd.$1.90
B. B. Caps, Round Ball....$1.40
Central Fire.....25%
Target and Sporting Rifle..15&5%
Primed Shells and Bullets.15&10%
Rim Fire, Sporting.....50%
Rim Fire, Military.....15&5%

Casters—

Bed.....65&10%
Plate.....60&5%
Philadelphia.....70&10%
Acme, Ball Bearing.....35%
Gem (Roller Bearing).....70&10&10&5%
Steel Gem.....20%
Standard Ball Bearing.....45%
Yale (Double Wheel) low list..40&10%

Cattle Leaders—

See *Leaders, Cattle.*

Chain, Proof Coil—

American Coil, Straight Link:

3-16	¼	5-16	⅜	7-16	½	9-16
$8.77	6.17	5.02	4.57	4.37	4.27	4.22

⅝ ¾ ⅞ to 1 1⅛ to 1¼ inch.
4.17 4.07 4.02 4.12

In cask lots, deduct 25¢.
German Coil.....60&10&10@70%

Halter—

Halter Chains.....60@60&5%
German Pattern Halter Chains, list July 24, '97.....60&10&5%
Covert Mfg. Co, Halter.....35&5%

Cow Ties—

See *Halters and Ties.*

Trace, Wagon, &c.—

Traces, Western Standard: 100 pr.
6½—6-3, *Straight, with ring*.$28.00
6½—6-2, *Straight, with ring*.$29.00
6½—8-2, *Straight, with ring*.$32.00
6½—10-2, *Str'ght, with ring*.$37.00

NOTE—*Add 2c per pair for Hooks, Twist Traces; add per pair for Nos. 2 and 3, 2c; No. 1, 3c; No. 0, 4c to price of Straight Link.*

Eastern Standard Traces, Wagon Chain, &c.....60%

Miscellaneous—

Jack Chain, list July 10, '93:
Iron.....60&10%
Brass.....50&10%
Safety and Plumbers' Chain, 60&10%
Gal. Pump Chain....*lb*. 4½@4¾%
Covert Mfg. Co.:
Breast, Halter, Heel, Rein, Stallion.....40%
Oneida Community:
American Halter, Dog and Kennel Chains.....35&2½@40%
Niagara Dog Leads and Kennel Chains.....45@50&5%
Wire Goods Co.:
Dog Chain.....70%
Universal Dbl.-Jointed Chain.....50%

Chain and Ribbon, Sash—

Oneida Community:
Steel Chain.....60%
Pullman:
Bronze Chain, 60%; Steel Chain, 60&10%
Sash Chain Attachments, per set..8¢
Aluminoy Sash Ribbon, per 100 ft.....$1.25@$3.00
Sash Ribbon Attachments, per set.8¢

Chalk—(From Jobbers.)

Carpenters' Blue....*gro.*, 50@55¢
Carpenters' Red....*gro.*, 45@50¢
Carpenters' White...*gro.*, 40@45¢

Checks, Door—

Bardsley's.....48%
Pullman, per gro.....$54.00
Russwin.....33⅓%

Chests, Tool—

American Tool Chest Co.:
Boys' Chests, with Tools.....50%
Youths' Chests, with Tools.....25%
Gentlemen's Chests, with Tools..25%
Farmers', Carpenters,' etc., Chests, with Tools.....20%
Machinists' and Pipe Fitters' Chests, Empty.....45%
Tool Cabinets.....45%
C. E. Jennings & Co.'s Machinists' Tool Chests.....7½%

Chisels—Socket Framing and Firmer

Standard List.....70&10@75%
Buck Bros.....30%
C. E. Jennings & Co.:
Socket Firmer No. 10.....25&7½%
Socket Framing No. 15.....25&7½%
Swan's.....66⅔@70%
L. & I. J. White Co.....30@30&5%

Tanged—

Tanged Firmers.....30&5@35%
Buck Bros.....30%
C. E. Jennings & Co. Nos. 191, 181..25%
L. & I. J. White Co.....25&5%

Cold—

	lb.
Cold Chisels, good quality	13@15¢
Cold Chisels, fair quality	11@12¢
Cold Chisels, ordinary	9@10¢

Chucks—

Almond Drill Chucks.....35%
Almond Turret Six-Tool Chuck.....40%
Beach Pat., each $8.00.....35&5%
Empire.....25%
Blacksmiths'.....25%
Jacobs' Drill Chucks.....35%
Pratt's Positive Drive.....25%
Skinner Patent Chucks:
Independent Lathe Chucks.....35%
Universal, Reversible Jaws.....35%
Combination, Reversible Jaws.....35%
Drill Chucks, New Model, 25%; Standard, 45%; Skinner Pat., 25%; Positive Drive.....40%
Planer Chucks.....20%
Face Plate Jaws.....35%
Standard Tool Co.:
Improved Drill Chuck.....45%
Union Mfg. Co.:
Combination, Nos. 1, 2, 3, 4, 5, 6, 7, 8 and 17, 40%; No. 21.....35%
Scroll Combination, Nos. 83 and 84.....30%
Geared Scroll, Nos. 33, 34 and 35..25%
Independent Iron, Nos. 18 and 318.35%
Independent Steel, No. 61.....25%
Union Drill, Nos. 000, 00, 100, 101, 102, 103, 104.....35%
Union Czar Drill.....25%
Universal, 11, 12, 16, 17, 13, 14, 15..40%
Universal, No. 42.....35%
Iron Face Plate Jaws, Nos. 28, 30, 48 and 50.....35%
Steel Face Plate Jaws, Nos. 70 and 72.....30%
Westcott Patent Chucks:
Lathe Chucks.....50%
Little Giant Auxiliary Drill.....50%
Little Giant Double Grip Drill..50%
Little Giant Drill, Improved.....50%
Oneida Drill.....50%
Scroll Combination Lathe.....50%

Clamps—

Adjustable, Hammers'.....20@20&5%
Carriage Makers', P., S. & W. Co.....50&10%
Besly, Parallel.....33⅓&10%
Myers' Hay Rack.....45%
Lineman's Swedish Neverturn.....65%
Wood Workers, Hammers'.....40&10%
Saw Clamps, see Vises, Saw Filers'.

Cleaners, Drain—

Iwan's Champion, Adjustable.....50%
Iwan's Champion, Stationary.....40%

Sidewalk—

Star Socket, All Steel, ℔ doz. $4.05 net
Star Shank, All Steel, ℔ doz. $3.24 net
W. & C. Shank, All Steel, ℔ doz., 7½ in., $3.00; 8 in., $3.25.

Cleavers, Butchers'—

Foster Bros.....30%
Fayette R. Plumb.....30%
L. & I. J. White Co.....30%

Clippers, Horse and Sheep—

Chicago Flexible Shaft Company:
1902 Chicago Horse, each..$10.75
20th Century Horse, each..$5.00
Lightning Belt Horse, each.$15.00
Chicago Belt Horse, each.$20.00
Stewart's Enclosed Gear Horse, each.....$6.75
Stewart's Patent Sheep Shearing Machine, each.....$12.75
Stewart Enclosed Gear Shearing Machine, No. 8, each..$9.75

Clips, Axle—

Regular Styles, list July 1, '05, 80&10&10%

Cloth and Netting, Wire

—See *Wire, &c.*

Cocks, Brass—

Hardware list:
Plain Bibbs, Globe, Kerosene, Racking, Liquor, Bottling, &c.....60&10@65%
Compression Bibbs..55&10@60%

Coffee Mills—

See *Mills, Coffee.*

Collars, Dog—

Nickel Chain, Walter B. Stevens & Son's list.....40%
Leather, Walter B. Stevens & Son's list.....40%

Compasses, Dividers, &c.

Ordinary Goods.....70&10@75%
Wm. Schollhorn Co.:
Excelsior Dividers.....60%
Lodi Dividers.....70&10%

Conductor Pipe,—

L. C. L. to Dealers:

	Galvanized		
Galv. Steel.	*Charcoal Iron.*	*Copper. 14, 16&20 oz.*	
Eastern:			
70%	50&17½%	30&10%	
Central:			
70&5%	60%	30&10%	
Western and Southern:			
70%	55&5%	30&7½%	
So. Western			
65&5%	50&5%	30&5%	

Terms, 60 days; 2% cash 10 days. Factory shipments generally delivered.

See also Eave Troughs.

Coolers, Water—

L. & G. Mfg. Co.:

Gal.	2	3	4	6	8
Galvanized, ea.	$1.85	$2.00	$2.25	$2.90	$3.90
Galvanized, Lined, side handles, Gal.	2	3	4	6	8
Each	$1.95	$2.15	$2.40	$3.30	$4.15

White Enameled.....10%
Agate Lined.....10%

Coopers' Tools—

See *Tools, Coopers'.*

Coppers' Soldering—

Soldering Coppers, 3 lbs. to pair and heavier, 30@33¢; lighter than 3 lb. to pair.....32@35¢

Cord—Sash—

Braided, Drab.....*lb.* 35¢
Braided, White, Com., Nos. 8 to 12, 26¢; No. 7, 26½¢; No. 6, 27½¢.
Cable Laid Italian, lb., No. 18..37¢
Italian, lb., A, No. 18, 25¢; B, 22¢
Common India.....*lb.*, 11@11½¢
Cotton Sash Cord, Twisted.18@20¢
Patent Russia.....*lb*...20¢
Cable Laid Russia.....*lb*...21¢
India Hemp, Br'd'd.....*lb*...21¢
India Hemp, Twisted...*lb*.13@14½¢
Patent India, Twisted...*lb*...17¢
Pearl Braided, cotton, No. 6, ℔ lb, 27½¢; No. 7, 26½¢; Nos. 8 to 12, 26¢
Eddystone, Braided, Nos. 8 to 12, 26¢; 7, 26½¢; 6, 27½¢.
Harmony Cable Laid Italian, Nos. 7 to 10.....℔ lb 23 ¢
Pullman:
Wire Sash Cord.....18%
Sash Cord Attachments, per doz.10¢
Samson, Nos. 8 to 12:
Braided, ℔ lb., Drab Cotton, 55¢; Italian Hemp, 40¢@50¢; Linen, 65¢; White Cotton, 50¢; Spot Cord.....50¢ } 15%
Massachusetts, White....℔ lb 40¢
Massachusetts, Drab.....℔ lb 45¢
Phoenix, White, Nos. 8 to 12, 27¢;
Silver Lake, per lb.:
A, Drab, 45¢; A, White, 40¢; B, Drab, 40¢; B, White, 35¢; Italian Hemp, 40¢; Linen....57½¢

See also Chain and Ribbon.

Wire, Picture—

List July 10, 1906.....90@—%
Hendryx Standard Wire Picture Cord, old list, 85&10%
Turner & Stanton Co, Wire Picture Cord.....85&10%

Cradles—

Grain.....40&12½%

Crayons—

White Round Crayons, Cases, 100 gro., $6.50@$7.50 at factory, but lower prices made by jobbers
Zelnicker's Lumber, ℔ gro. White and Purple, Indelible....$7.50
Blue, Red, Green, Yellow and Terra Cotta, $6.50; Black.....$4.00
Giant Lumber, 5¼ in. x 15-16 in. round, all colors, $16.25; Indelibles.....$18.75
Genuine Soapstone, Metal Workers', 5 in. x ¼ in. Round, $2.50; 5 in. x ¼ in. Square, $1.75; 5 x ½ x 3-16, $2.50; 5 x 1¼ x 3-16.....$3.00

Crooks, Shepherds'—

Fort Madison, per doz., Heavy, $5.50; Light.....$5.00

Crow Bars—See *Bars, Crow.*

Cultivators—

Victor Garden.....50%

Cutlery, Table—

International Silver Company:
No. 12 M'd'm Knives, 1847, ℔ doz. $3.50
Star, Eagle, Rogers & Hamilton and Anchor.....℔ doz. $3.00
Wm. Rogers & Son.....℔ doz. $2.50

Cutters—Glass—

H. H. Mayhew Co.....40%
Red Devil.....60%
B. Mfg. Co.....40%
Woodward.....50%

Meat and Food—

American.....30%

Nos.	401	402	403	404	405	406	407
Each	$5	$7	$10	$12	$25	$50	$60

Enterprise:

Nos.	5	10	12	22	32
Each	$2	$3	$2.75	$4.50	$6

25@25&7½%
No. 202, $1.50.....40&7½%
P., S. & W. Co.:
Dixon's.....℔ doz. 33⅓%

Nos.	1	2	3	4
	$14.00	$17.00	$19.00	$30.00

Ideal.....40@40&5%
Hales.....60&10&5%
Little Giant.....℔ doz. 40@50%

Nos.	305	310	312	320	322
	$35.00	$48.00	$44.00	$72.00	$68.00

New Triumph No. 605, ℔ doz, $24.00, 40&10%
Russwin Food, No. 1, $24.00; No. 2, $27.00.....45&10&10%
Enterprise Beef Shavers.....$15.00 $18.00
25@30%

Slaw and Kraut—

Henry Disston & Sons:
Slaw and Kraut Cutters.....35%
Corn Graters.....30%
J. M. Mast Mfg. Co.:
Slaw Cutters, 1 Knife....℔ doz. $3.00
Combined Slaw Cutter and Corn Grater.....℔ doz. $4.00

Tobacco—

All Iron, Cheap..*doz.* $1.25@$4.50
Enterprise.....25@30%
National, ℔ doz., No. 1, $21; No. 2, $18.....40%

Diggers, Post Hole, &c.—

Disston's:
Rapid, ℔ doz., $24.00.....25%
Samson, ℔ doz., $34.00.....25%
Iwan's Improved Post Hole Auger..40%
Vaughan Pattern Post Hole Augers, ℔ doz., $7.00
Perfection Post Hole Diggers, ℔ doz.....$8.75
Split Handle Post Hole Diggers, ℔ doz., $7.75
Hercules Pattern, ℔ doz.....$10.00
Kohler's, ℔ doz., Universal, $15.00; Little Giant, $12.00; Hercules, $10.00; Invincible, $9.00; Rival, $8.50; Pioneer.....$7.50
Never-Break Post Hole Diggers, ℔ doz., $24.00.....60%

Dividers—See *Compasses.*

Drawing Knives—

See *Knives, Drawing.*

Dressers, Emery Wheel—

Sterling Emery Wheel Dressers.....35%
Sterling Wheel Dresser Cutters.....35%

Drills and Drill Stocks—

Blacksmiths' Common Drilling Machines.....$1.50@$1.75
Breast, Millers Falls.....15&10%
Breast, P., S. & W.....33⅓%
Goodell Automatic Drills.50&10@60&10%
Millers Falls Automatic Drills.33⅓&10%
Ratchet, Curtis & Curtis.....25%
Ratchet, Parker's.....40%
Ratchet, Weston's.....40%
Ratchet, Weston's, Style H Improved.....40%
Ratchet, No. 012.....40%
Ratchet, Celebrated.....40%
Ratchet, Whitney's, P., S. & W. 50&5%
Whitney's Hand Drill, No. 1, $10.00; Adjustable, No. 10, $12.00.....33⅓%

Twist Drills—

Bit Stock.....60&10&10@70%
Taper and Straight Shank.... 60&10@60&10&5%

Drivers, Screw—

Screw Driver Bits, per doz..45@50¢
Balsey's Screw Holder and Driver, ℔ doz., 2½-in., $6; 4-in., $7.50; 6-in., ℔.....60%
Buck Bros.' Screw Driver Bits.....30%
Champion.....50%
Disston's.....70%
Fray's Hol. H'dle Sets, No. 3, $12.50
Ford's Brace Screw Drivers....40&10%
Gay's Double Action Ratchet.....35%
Goodell's Auto.....65@65&10%
Mayhew's Black Handle.....40%
Mayhew's Monarch.....40%
Millers Falls, Nos. 20 and 21, 25&10%
Millers Falls, Nos. 11, 12, 41, 42, 15&10%
Smith & Hemenway Co., Neverturn, 66⅔%; Elmora, 60%; Star, 30&10%
Swan's:
Nos. 7565 to 7568, 50%; No. 7540, 40&10%

Eave Trough, Galvanized—

Territory.	*L. C. L. Galvanized*	
Galv. Steel.	*Charcoal Iron.*	*Copper. 14, 16&20 oz.*
Eastern:		
70&30%	70%	30&10%
Central:		
80%	70&5%	30&10%
Western and Southern:		
70&30%	70%	30&7½%
So. Western:		
75&7½%	65&5%	30&5%

Terms.—2% for cash. Factory shipments generally delivered.

See also Conductor Pipe and Elbows.

Elbows and Shoes—

Factory shipments, all territories:
Galv. Steel and Galv. C. I.
Standard Gauge.....80%
No. 26.....50%
No. 24.....25%
No. 22.....10%
Copper.....40&10%

Elbows, Stove Pipe—

Edwards, Standard Blue.....40&10&10%
Edwards, Royal Blue.....40&10&10%
Reeves, Dover, one piece.....40&10%

Emery, Turkish—

	4 to 46:	*5 to 220:*	*Flour.*
Kegs.....*lb.*	5 ¢	5½ ¢	5¾ ¢
½ Kegs.....*lb.*	5¼ ¢	5¾ ¢	5¾ ¢
¼ Kegs.....*lb.*	5½ ¢	6 ¢	6 ¢
10-lb. cans, 10 in case....	6½ ¢	7 ¢	6 ¢
10-lb. cans, less than 10.....	10 ¢	10 ¢	8 ¢
Less quantity..	10 ¢	10 ¢	8 ¢

NOTE.—In lots 1 to 3 tons a discount of 10% is given.

Extractors, Lemon Juice
—See *Squeezers, Lemon.*

Fasteners, Blind—
Zimmerman's .....50&10%
Walling's .....40&10%
Upson's Patent.....40%

Cord and Weight—
Ives and Titan.....33⅓%

Faucets—
Cork Lined.....50&10@60%
Metallic Key, Leather Lined..60&10@70%
Red Cedar.....40&5@40&10&5%
Petroleum .. ..70&10@75%
B. & L. B. Co.:
Metal Key.....60&10%
Star 60%
West Lock.....50&10%
John Sommer's Peerless Tin Key....40%
John Sommer's Boss Tin Key.....50%
John Sommer's Victor Mtl. Key.50&10%
John Sommer's Duplex Metal Key..60%
John Sommer's Diamond Lock.....40%
John Sommer's I.X.L. Cork Lined...50%
John Sommer's Reliable Cork Lined..50&10%
John Sommer's Chicago Cork Lined.60%
John Sommer's O. K. Cork Lined...50%
John Sommer's No Brand, Cedar....50%
John Sommer's Perfection, Cedar....40%
Self Measuring:
Enterprise, ₱ doz. $36.00.....40&10%
Lane's, ₱ doz. $36.00.....40&10%
National Measuring, ₱ doz. $36.40&10%

Felloe Plates—
See *Plates, Felloe.*

Files— Domestic—
List Nov. 1, 1899.
Best Brands.....70&10@75&10%
Standard Brands.75&10@75&10&10%
Lower Grade....75&10&10@80&10%

Imported—
Stubs' Tapers, Stubs' list, July 24, '97.....33 1-3@40%

Fixtures, Fire Door—
Allith Underwriters' Approved.....50%
Richards Mfg. Co.:
Universal, No. 103; Special, No. 104 .....$3.75
Fusible Links, No. 96.....50%
Expansion Bolts, No. 107.....60&10%

Grindstone—
Net Prices:

Inch	*15*	*17*	*19*	*21*
Per doz.	*$3.60*	*3.85*	*4.15*	*4.65*

P., S. & W. Co.....25%
Reading Hardware Co.....60%

Fodder Squeezers—
See *Compressors.*

Forks—
NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.
Iowa Dig-Ezy Potato.....60&10%
Victor, Hay.....60&15&2½%
Victor, Manure.....66⅔%
Victor, Header.....65%
Champion, Hay.....66⅔%
Champion, Header.....65%
Champion, Manure.....60&15&2½%
Columbia, Hay.....60&20%
Columbia, Manure.....70%
Columbia, Spading.....70&12½%
Hawkeye Wood Barley.....40%
W. & C. Favorite Wood Digger.....60&10%
Acme Hay.....60&20%
Acme Manure, 4 tine.....60&10&5%
Dakota Header.....60&20%
Jackson Steel Barley.....60&20%
Kansas Header.....65%
W. & C. Favorite Wood Barley.....40%
Plated.—See Spoons.

Frames— Wood Saw—
White, S'g't Bar, per doz.75@80¢
Red, S'g't Bar, per doz..$1.00@1.25
Red, Dbl. Brace, per doz.$1.40@1.50

Freezers, Ice Cream—

Qt.	*1*	*2*	*3*	*4*	*6*
Each	*$1.25*	*$1.60*	*$1.90*	*$2.20*	*$2.80*

Fruit and Jelly Presses—
See *Presses, Fruit and Jelly.*

Fry Pans—See *Pans, Fry.*

Fuse— *Per 1000 Feet.*
Hemp $2.75
Cotton 3.20
Waterproof Sgl. Taped..3.65
Waterproof Dbl. Taped..4.40
Waterproof Tpl. Taped..5.15
} *10&2½%*

Gates, Molasses and Oil—
Stebbins' Pattern.....75@80%

Gauges—
Marking, Mortise, &c..50@50&10%
Chapin-Stephens Co.:
Marking, Mortise, &c .....50&50&10%
Disston's Marking, Mortise, &c..67½%
Wire, Brown & Sharpe's.....33⅓%
Wire, Morse's.....25%
Wire, P., S. & W. Co.....33⅓%

Gimlets— Single Cut—
Numbered assortments, per gro.
Nail, Metal, No. 1, $2.00; 2, $2.30
Spike, Metal, No. 1, $4.00; 2, $4.30
Nail, Wood Handled, No. 1, $2.30; 2, $2.60
Spike, Wood Handled, No. 1, $4.30; 2, $4.60

Glass, American Window
See *Trade Report.*

Glasses, Level—
Chapin-Stephens Co.....65@65&10%

Glue, Liquid Fish—
Bottles or Cans, with Brush..25&10@50%
Elwell's 40%

Grease, Axle—
Common Grade....gro. $6.00@6.50
Dixon's Everlasting, 10-lb pails, ea. 85¢; in boxes, ₱ doz., 1 lb. $1.20; 2 lb.....$2.00
Helmet Hard Oil.....25%

Griddles, Soapstone—
Pike Mfg. Co.....33⅓@33⅓&10%

Grinders—
Royal Mfg. Co.:
Alundum Grinding Machines, each, Nos. 01, $1.75; 1A, $2.50; 10, $5.00 .....30%
Alundum Sickle Grinders, each, Nos. 20, $5.00; 20A, $6.00; 20A Combined, $6.50.....30%
Alundum Disc Grinders, each, $2.50 .....30%

Grindstones—
Pike Mfg. Co.:
Improved Family Grindstones, ₱ inch, ₱ doz., $2.00.....33⅓%
Richards Mfg. Co., Eli and Cycle, Ball Bearing, mounted.....40%

Grips, Nipple—
Perfect Nipple Grips.....40&10&2%

Halters and Ties—
Cow Ties.....60&5@60&10%
Covert Mfg. Co.:
Web .....30&2%
Jute Rope.....35%
Sisal Rope.....20%
Cotton Rope.....45%
Hemp Rope.....45%
Oneida Community:
Am. Coil and Halters.....40@40&5%
Am. Cow Ties.....45@60%
Niagara Coil and Halters..45@50&5%
Niagara Cow Ties....45&5@50&10&5%

Hammers—
Handled Hammers—
Heller's Machinists'...55&10@55&10&5%
Heller's Farriers'.....40&5@40&10&5%
Peck, Stow & Wilcox Co.:
Crucible Steel.....50%
Farriers' .....40&10&5%
Riveting 50%
Machinists', revised list.....66⅔&5%
Blacksmiths' .....50&5%
Fayette R. Plumb:
A. E. Nail.....40&2½@40&12½%
Eng. and B. S. Hand.50&10&5@60&5%
Machinists' Hammers.....60@60&10%
Rivet and Tinners'.40&7½@40&12½&5%

Heavy Hammers and Sledges—
Under 3 lb., per lb., 50¢ .80@80&5%
3 to 5 lb., per lb., 40¢ .80@80&5%
Over 5 lb., per lb., 30¢ .....80&10@80&10&5%
Wilkinson's Smiths'...lb. 9½@10¢

Handles—
Agricultural Tool Handles
Axe, Pick, &c.....60&10@60&10&5%
Hoe, Rake, &c.....40%
Fork, Shovel, Spade, &c.:
Long Handles.....40%
D Handles.....40%

Cross-Cut Saw Handles—
Atkins 40%
Champion 50%
Disston's 50%

Mechanics' Tool Handles—
Auger, assorted...gro. $3.00@$3.50
Brad Awl.....gro. $1.65@$1.75
Chisel Handles, Ass'd, per gro.:
Tanged Firmer, Apple, $2.40@$2.65; Hickory.....$2.15@2.40
Socket Firming, Apple, $1.75@$1.95; Hickory....$1.60@$1.75
Socket Framing, Hickory, $1.60@$1.75
File, assorted.....gro. $1.30@$1.40
Hammer, Hatchet, &c. 60&10@60&10&5%
Hand Saw, Varnished, doz. 80&85¢; Not Varnished...65@75¢
Plane Handles:
Jack, doz. 30¢; Jack, Bolted.75¢
Fore, doz. 45¢; Fore, Bolted.90¢
Chapin-Stephens Co.:
Carving Tool.....30@30&10%
Chisel .....60@60&10%
File and Awl.....60@60&10%
Saw and Plane.....30@30&10%
Screw Driver.....30@30&10%
Millers Falls Adj. and Ratchet Auger Handles .....15&2½%
Nicholson Simplicity File Handle....₱ gro. $0.85@$1.50
W. A. Zelnicker Supply Co.:
Hammer, ₱ doz., 12 in., $2.00; 14 in., $2.00; 16 in., $2.30; 18 in., $2.50; 20 in., $2.70; 22 in., $3.00; 24 in., $3.30; 26 in., $3.50; 30 in., $3.80.
Sledge, ₱ doz., oval, 30 in., $3.80; octagon, 30 in., $3.80; oval, 36 in., $4.00; octagon, 36 in., $4.00.
Axe, ₱ doz., 28 to 34 in., $5.60; 36 in., $5.80.
Adze, ₱ doz., 36 in., $5.80; 36 in., $7.80.
Pick, ₱ doz., R. R., 36 in., $8.00; coal, 34 in., $5.80.
Hatchet, ₱ doz., 12 to 14 in., $2.00.
} *New*

Hangers—
NOTE.—Barn Door Hangers are generally quoted per pair, without track, and Parlor Door Hangers per double set with track, &c.
Allith Mfg. Co.:
Reliable, Nos. 1 and 2; Allith, No. 3; Allith Adjustable, No. 6; Reliable Parlor Door.....50%
Chicago Spring Butt Co.:
Friction 25%
Oscillating 25%
Big Twin.....25%
Chisholm & Moore Mfg. Co.:
Baggage Car Door.....50%
Elevator 30%
Railroad 50%
Cronk & Carrier Mfg. Co.:
Loose Axle.....60&2½%
Roller Bearing.....70&2½%
Griffin Mfg. Co.:
Solid Axle, No. 10, $12.00..60&10%
Roller Bearing, No. 11, $15.00, 60&10%
Roller Bearing, Ex. Hy., No. 22, $18.00.....60&10%
Bull Dog, $24.00.....70%
Lane Bros. Co.:
Parlor, Ball Bearing, $4.00; Standard, $3.15; No. 105, $2.85; New Model, $2.80; New Champion $2.25
Barn Door, Standard.....60&10%
Hinged .....net $6.08
Covered .....60&5%
Special .....70&5%
Lawrence Bros.:
Advance .....55&10%
Cleveland .....70&7½%
Clipper, No. 75.....60%
Crown .....55&10%
Cyclone, No. 40.....net $6.50
Tandem, No. 50.....net $7.50
New York.....55&10%
McKinney Mfg. Co.:
Roller Bearing, Nos. 1 and 2.70%
Anti-Friction 60%
Hinged Hangers, King Charm.60%
Meyers' Stayon Hangers.....60%
Richards Mfg. Co.:
Hangers, Nos. 47, 48, 147, 247, 60&5%
Pioneer Wood Track, No. 3..$2.25
Roller B'r'g St'l Track No. 12.$2.20
Roller B'r'g St'l Track No. 13.$2.50
Roller B'r'g, Nos. 39, 41, 43, 70&7½%
Hero, Adj. Track No. 19..50&10%
Adjustable Track Tandem Trolley Track No. 16.....50&10%
Seal, Steel Track No. 8.....$2.25
Auto Adj. Track No. 22.—50&5%
Trolley B. D. No. 17, $1.25; F. D. No. 120, $2.25; No. 121, $2.45; No. 150.....$2.50
Safety Underwriters F. D. No. 101 .....50%
Tandem No. 44..2½ and 3 60&10%
Palace, Adjustable Track No. 132 .....50&5%
Royal, Adjustable Track No. 122 .....50&10%
Ives' Wood Track No. 1.....$2.25
Trolley B. D. No. 20.....50&10%
Trolley B. D. No. 24, $1.30; No. 27, $1.40; No. 28.....$1.60
Roller Bearings, Nos. 37, 38, 39, 41, 43, 44, Sizes 1 and 2.70&7½%
Anti-friction, No. 42; No. 44, sizes 2½ and 3.....60%
Hinged Tandem No. 48....60&5%
Folding Door B. B. Swivel No. 135 .....40%
Taylor & Boggis F'y Co.'s Kidder's Roller Bearing.50&15&10&5%
} *Extra 5@10% often given.*

Hangers— Garment—
Pullman Trouser, ₱ gro., 1 pair Flat Aluminoy, $9.00; 1 pair Round Nickeled, $9.00; 4 pair Round Nickeled, $27.00; 1 pair Flat Gun Metal, $12.00; 1 pair Flat Black Enameled, $7.50; 1 pair Wood Clamp, $13.50; Skirt Hangers, Folding, per gro., $21.00; Coat Hangers, Folding, per gro., $8.00; Garment Hanger Rods, Round Nickeled, per gro., $10.50; Garment Hanger Loops, Round Nickeled, per gro.....$10.50
Victor Folding.....₱ gro. $9.60

Gate—
Myers' Patent Gate Hangers, ₱ doz. net $4.50

Joist and Timber—
Lane Bros. Co.....30%

Hasps—
Griffin's Security Hasp.....50&10%
McKinney's Perfect Hasp, ₱ doz..60%

Hatchets—
Regular list, first qual..40&7½%—
Second quality.....50&10%—

Heaters, Carriage—
Clark, No. 5, $1.75; No. 5B, $2.00; No. 3, $2.25; No. 3D, $2.75; No. 7D, $3.00; No. 3E, $3.25; No. 1, $3.50.....25%
Clark Coal, ₱ doz., $0.75.....20%

Hinges—
Blind and Shutter Hinges
Surface Gravity Locking Blind: (Victor; National; 1868 O. P.; Niagara; Clark's O. P.; Clark's Tip; Buffalo.)

No.	*1*	*2*	*3*
Doz. pair	*$0.75*	*1.35*	*2.70*

Mortise Shutter: (L. & P., O. S., Dixie, &c.)

No.	*1*	*1½*	*2*	*2½*
Doz. pair	*$0.70*	*.65*	*.60*	*.55*

Mortise Reversible Shutter (Buffalo, &c.):

No.	*1*	*1½*	*2*
Doz. pair	*$0.70*	*.65*	*.60*

North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50.....10%
Charles Parker Co.....70@75%
Parker Wire Goods Co.:
Hale & Benjamin Automatic Blind Hinges 20%
Hale's Blind Awning Hinges, No. 110, for wood, $9.00; No. 111, for brick, $9.00.....20%
Reading's Gravity.....60%
Stanley's Steel Gravity Blind Hinges, No. 1647½, ₱ doz. sets, without screws, $0.95; with screws, $1.25.
Wrightsville Hardware Co.:
O. S., Lull & Porter.....75&5%
Acme, Lull & Porter.....75%
Queen City Reversible.....75%
Shepard's Noiseless, Nos. 60, 65, 55 .....75&5%
Niagara, Gravity Locking, Nos. 1, 3 & 5.....75&5%
Tip Pat'n, No. 1.....75&10%
No. 3.....75&5%
Buffalo Gravity Locking, Nos. 1, 3 & 5.....70&10&5%
Shepard's Double Locking.....75%
Champion Gravity Locking.....75&5%
Pioneer .....75&10%
Empire 65%
W. H. Co.'s Mortise Gravity Locking, No. 2.....60&10%

Gate Hinges—
Clark's or Shepard's—Doz. sets:

No.	*1*	*2*	*3*
Hinges with L't'chs.	*$2.00*	*2.70*	*5.00*
Hinges only	*1.40*	*2.05*	*3.80*
Latches only	*.70*	*.70*	*.35*

New England:
With Latch.....doz. ...@$2.00
Without Latch...doz. ...@$1.60
Reversible Self-Closing:
With Latch.....doz. ...@$1.75
Without Latch...doz. ...@$1.35
Western:
With Latch.....doz. $1.75
Without Latch.....doz. $1.15
Wrightsville Hardware Co.:
Shepard's or Clark's Hinges and Latches, Hinges only or Latches only, Nos. 1, 2 or 3.....70%

Pivot Hinges—
Bommer Bros. Pivot.....40%
Lawson Mfg. Co. Matchless.....50%

Spring Hinges—
Holdback, Cast Iron...$6.75@$7.00
Non-Holdback, Cast Iron$6.50@$6.75
J. Bardsley:
Bardsley's Non-Checking Mortise Floor Hinges.....40%
Bardsley's Patent Checking.33⅓%
Bommer Bros.:
Bommer Ball Bearing Floor..40%
Bommer Spring Hinges.....40%
No. 999 Wrot. Steel Hold Back, ₱ gr. $9.00
Chicago Spring Butt Co.:
Chicago Spring Hinges.....25%
Triple End Spring Hinges....50%
Chicago (Ball Bearing) Floor..50%
Garden City Engine House....25%
Keene's Saloon Door.....25%
Columbian Hardware Co.:
Acme, Wrought Steel.....30%
Acme, Brass.....25%
American 30%
Columbia, ₱ gr., No. 14, $9.00; No. 18, $25.00
Columbia, Adj., No. 7, ₱ gr. $12.00
Columbian Hinges.....60&10%
Gem, new list.....30%
Clover Leaf.....₱ gr. $12.00
Oxford, new list.....30%
Floor Spring Hinges.....65&10%
Lawson Mfg. Co. Matchless....30%
Richards Mfg. Co.:
Superior Double Acting Floor Hinges 40%
Shelby Spring Hinge Co.:
Buckeye All Steel Holdback Screen Door.....₱ gr. $9.00
Chief Ball Bearing Floor Hinge 60%
Ball Bearing Door.....25%
No. 777, Sheet Steel Holdb'k, ₱ gr. pr.....$9.00
Superior Spring Hinge Co.:
Superior Floor Hinges.....33⅓%
} *Extra 10% often given on most of these Hinges.*

Wrought Iron Hinges—
Strap and T Hinges, &c., list December 20, 1904:
Light Strap Hinges..50&10%
Heavy Strap Hinges..60&5%
Light T Hinges.....50%
Heavy T Hinges.....40%
Extra Hvy. T Hinges.50&10%
Hinge Hasps.....33⅓%
Cor. Heavy Strap...60&5%
Cor. Ex. Heavy T...50&10%
} *Extra 10&7½%.*

Screw Hook and Strap.
6 to 12 in..lb. 3¼¢
14 to 20 in..lb. 3½¢
22 to 36 in..lb. 3¼¢

Screw Hook and Eye:
¾ to 1 inch.....lb. 6½¢
⅝-inch.....lb. 7½¢
½-inch .....lb. 8½¢

Hitchers, Stall—
Covert Mfg. Co., Stall Hitchers..30&2%

Hods— Coal—
M'f'gr's list, price per gross.

Inch	*15*	*16*	*17*	*18*
Galv. Open	*$35*	*$39*	*$42*	*$46*
Jap. Open	*26*	*28*	*31*	*35*
Galv. Funnel	*43*	*48*	*52*	*56*
Jap. Funnel	*33*	*36*	*39*	*43*

} *New 10&5%*

Masons' Etc.—
Cleveland Wire Spring Co.:
Steel Brick, No. 162.....each $1.05
Steel Mortar, No. 158.....each $1.35

Hoes— Eye—
Scovil and Oval Pattern.....60&10@60&10&10%
Grub, list Feb. 23, 1899.....60&10@75&10%

D. & H. Scovil.....27½%
Am. Fork & Hoe Co. (Scovil Patterns).....60%

Handled—

NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.

Cronk's Weeding, No. 1, $2.00; No. 2, $2.50
Star Double Bit.....$3.20
Ft. Madison Cotton Hoe....70&10&10%
Ft. Madison Crescent Cultivator Hoe, ₱ doz.....70&10%
Ft. Madison Mattock Hoes:
Regular Weight.....₱ doz. 40&5%
Junior Size.....₱ doz. $4.00
Ft. Madison Sprouting Hoe, ₱ doz., 60&10%
Ft. Madison Dixie Tobacco Hoe.....75&10&7½%
Kretsinger's Cut Easy.....70&10%
Warren Hoe.....45&10%
W. & C. Ivanhoe.....75&2%
B. B. 6 in., Cultivator Hoe.....$3.40
B. B., 6½ in.....$3.50
Acme Wedding.....₱ doz., net, $4.36
W. & C. L'tning Shuffle Hoe, ₱doz.$5.25

Hoisting Apparatus—

See *Machines, Hoisting.*

Holders— Bit—

Angular, ₱ doz. $24.00.....45&10%

Door—

Bardsley's, Iron, 40%; Brass and Bronze.....25%
Empire.....50%
Pullman.....35%
Richards Mfg. Co.: No. 117, Ever-ready, 40%; Nos. 118, 119, Sure Grip.....50%
Superior.....33⅓%

File and Tool—

Nicholson File Holders and File Handles.....33⅓&40%

Fruit Jar—

Triumph Fruit Jar Holder, ₱ gross, $10.80; ₱ doz.....$1.25

Trace and Rein—

Fernald Double Trace Holder, ₱ doz. pairs.....$1.25
Dash Rein Holder, ₱ doz. pairs..$1.25

Hones—Razor—

Pike Mfg. Co., Belgian and Swaty, 50%; German.....33⅓%

Hooks—Cast Iron—

Bird Cage, Reading.....40%
Clothes Line, Reading List.....40%
Coat and Hat, Reading.....45&20%
Coat and Hat, Wrightsville.....60&5%
Harness, Reading List.....40%

Wire—

Belt.....80%
Wire C. & H. Hooks...70@70&10%
Bradley Metal Clasp Wire, Coat and Hat, 70&10%; Ceiling.....70&10%
Columbian Hdw. Co., Gem.....70&5%
Parker Wire Goods Co., King..70&10%
Wire Goods Co.:
Acme, 60&10%; Chief, 70%; Crown, 75%; Czar, 65%; V Brace, 75%; Czar Harness, 50&10%.

Wrought Iron—

Box, 6 in., per doz., $1.00; 8 in., $1.25; 10 in., $2.50.
Cotton.....*doz. $1.05@$1.25*
Wrought Staples, Hooks, &c.—See Wrought Goods.

Miscellaneous—

Hooks, Bench, see *Stops, Bench.*
Bush, Light, doz., $6.20; Medium, $6.75; Heavy, $7.65
Grass, best, all sizes, per doz.$3.00
Grass, common grades, all sizes, per doz.....$1.75
Whiffletree.....*lb. 5¾@6¢*
Hooks and Eyes:
Brass.....60@60&10%
Malleable Iron.....70@70&10%
Covert Mfg. Co. Gate and Scuttle Hooks.....40%
Ft. Madison Cut-Easy Corn Hooks, ₱ doz. $3.25 net
Turner & Stanton Co. Cup and Shoulder.....80&10%
Bench Hooks—See Bench Stops.
Corn Hooks—See Knives, Corn.

Horse Nails—

See *Nails, Horse.*

Horseshoes—

See *Shoes, Horses.*

Hose, Rubber—

Garden Hose, ¾-inch:
Competition.....*ft. 5 @ 6 ¢*
3-ply Guaranteed..*ft. 8 @ 9 ¢*
4-ply Guaranteed..*ft. 10 @11 ¢*
Cotton Garden, ¾-in., coupled:
Low Grade.....*ft. 8 @ 9 ¢*
Fair Quality.....*ft. 10 @11 ¢*

Irons— Sad—

From ¼ to 10.....*lb. 3 @3½¢*
B. B. Sad Irons.....*lb. 3¼@3½¢*
Mrs. Potts', cents per set:

Nos.	50	55	60	65
Jap'd Tops	83	80	93	91
Tin'd Tops	88	85	98	95

New England Pressing..*lb. 3¾@4¢*

Bar and Corner—

Richards Mfg. Co., Bar, 60&10%; Corner.....60%

Pinking—

Pinking Irons.....*doz. $9*

Irons, Soldering

See *Coppers.*

Jacks, Wagon—

Covert Mfg. Co.:
Auto Screw.....30&2%; Steel, 45%
Lockport.....50%
Lane's Steel.....30&5%
Richards' Tiger Steel, No. 130...50&10%
Smith & Hemenway Co.'s.....25%

Ladder—

Richards Mfg. Co., Ladder Jacks..50%

Kettles—

Brass, Spun, Plain.....*20@25%*
Enameled and Cast Iron—See Ware, Hollow.

Knives—

Butcher, Kitchen, &c.—

Foster Bros.' Butcher, &c.....30%
Wilkinson Shear & Cutlery Co....60%

Corn—

Columbian Cutlery Co., Wilcut Brand Knives and Hooks.....60%
Withington Acme, ₱ doz., $2.65; Dent, $2.75; Adj. Serrated, $2.20; Serrated, $2.10; Yankee No. 1, $1.50; Yankee No. 2, $1.15.

Drawing—

Standard List.....*75&5@75&10%*
C. E. Jennings & Co., Nos. 45, 46, 25&7½%
Jennings & Griffin, Nos. 41, 42, 66⅔&7½%
Swan's.....66⅔@70%
Watrous.....16⅔%
L. & I. J. White.....20&5@25%

Hay and Straw—

Serrated Edge, per doz.$5.50@5.75
Iwan's Sickle Edge.....₱ doz. $9.50
Iwan's Serrated.....₱ doz. $10.00

Miscellaneous—

Farriers'.....*doz. $3.00@3.25*
Wostenholm's.....₱ doz. $3.00@3.25

Knobs—

Base, 2½-inch, Birch, or Maple, Rubber Tip.....*gro. $1.25@1.40*
Carriage, Jap., all sizes.....*gro. 40@45¢*
Door, Mineral.....*doz. 65@70¢*
Door, Por. Jap'd.....*doz. 70@75¢*
Door, Por. Nickel..*doz. $2.05@2.15*
Bardsley's Wood Door, Shutters, &c.15%

Lacing, Leather—

See *Belting, Leather—*

Ladders, Store, &c.—

Allith Mfg. Co., Reliable.....50%
Lane's Store.....25%
Myers' Noiseless Store Ladders....45%
Richards Mfg. Co.:
Improved Noiseless, No. 112.....50%
Climax Shelf, No. 113.....50%
Trolley, No. 109.....50%

Ladles, Melting—

L. & G. Mfg. Co. (low list).....20%
P. S. & W.....40&10%
Reading.....60%

Lanterns—Tubular—

Regular, No. 0.....*doz. $4.35@4.50*
Side Lift, No. 0.....*doz. $4.60@4.75*
Hinge Globe, No. 0..*doz. $4.60@4.75*
Other Styles.....*40@40&10%*

Bull's Eye Police—

3-inch.....*$4.25@4.50*

Latches— Thumb—

Roggin's Latches, with screw..*doz. 35@40¢*

Door—

Allith Mfg. Co., Reliable and Alligator, 50%; Reliable Cold Storage, 50%
Cronk & Carrier Mfg. Co., No. 101, ₱ doz. $2.90
Richards' Bull Dog, Heavy, No. 125.....50&5%
Richards' Trump, No. 127.....$1.50

Leaders, Cattle—

Small.....*doz. 50¢; large, 60¢*
Covert Mfg. Co.:
Cotton, 45%; Hemp, 45%; Jute, 35%; Sisal, 20%.

Leathers, Pump—

See *Pumps—*

Lifters, Transom—

R. & E.....10%

Lines—

Wire Clothes, Nos.	*18*	*19*	*20*
100 feet	*$2.50*	*2.25*	*2.00*
75 feet	*$1.75*	*1.55*	*1.10*

Samson Cordage Works:
Solid Braided Chalk, Nos. 0 to 3..40%
Solid Braided Masons'.....30%
Silver Lake Braided Chalk, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50.....₱ gr. 20%
Masons' Lines, Shade Cord, &c.: White Cotton, No. 3½, $1.50; No. 4, $2.00; No. 4½, $2.50; Colors, No. 3½, $1.75; No. 4, $2.25; No. 4½, $2.75; Linen, No. 3½, $2.50; No. 4, $3.50; No. 4½, $4.50.....20%
Tent and Awning Lines: No. 5, White Cotton, $7.50; Drab Cotton, $8.50.....20%
Clothes Lines, White Cotton: 50 ft., $2.75; 60 ft., $3.25; 70 ft., $3.75; 75 ft., $4.00; 80 ft., $4.25; 90 ft., $4.75; 100 ft., $5.25.....20%
Turner & Stanton Co.:
Solid Braided Chalk, Masons' and Awning Lines.....40%
Clothes Lines, White Cotton.....20%
Shade Cord, Cotton or Linen....20%

Locks— Cabinet—

Cabinet Locks.....*33⅓ %*

Door Locks, Latches, &c.—

NOTE.—Net Prices are very often made on these goods.
Reading Hardware Co.....40%
R. & E. Mfg. Co.....10%

Padlocks—

R. & E. Mfg. Co. Wrought Steel and Brass.....75&10%

Sash, &c.—

Ives' Patent:
Bronze and Brass, 55&5%; Crescent, 60%; Iron, 60%; Window Ventilating, 40&20%; Robinson Pat. Ventilating Sash Lock, 33⅓%.
Pullman Patent Ventilating Lock..35%
Reading Sash Locks.....40%

Machines—Boring—

Com. Upr't, without Augers,
$2.00@2.25
Com. Angl'r, without Augers,
$2.25@2.50
Swan's Improved.....40&10%
Jennings', Nos. 1 and 4.....25&7½%
Millers' Falls.....5.75
Snell's, Upright, $2.65; Angular, $2.90

Corking—

Reisinger Invincible Hand Power....₱ doz. $48.00

Fence—

Williams' Fence Machines....each, $5.50

Hoisting—

Moore's Anti-Friction Chain Hoist.30%
Moore's Hand Hoist, with Lock Brake.....20%
Moore's Cyclone High Speed Chain Hoist.....25%

Ice Cutting—

Chandler's.....12½%

Washing

Boss Washing Machine Co.:	Per doz.
Boss No. 1	$57.00
Boss Rotary	57.00
Champion Rotary Banner No. 1	57.00
Standard Champion No. 1	50.00
Standard Perfection	27.00
Cincinnati Square Western	33.00
Uneeda American, Round	33.60

Mallets—

Hickory.....*45&5@50%*
Lignumvitæ.....*45&5@50%*
Tinners' Hickory and Applewood.....*doz. 45&5@50%*

Mangers, Stable—

Swett Iron Works.....50%

Mats, Door—

Elastic Steel (W. G. Co.), new list.50%
Keystone Wire Matting Co.:
Keystone.....50%
Ideal.....50%

Mattocks—

See *Picks and Mattocks.*

Milk Cans—See *Cans, Milk.*

Mills, Coffee, &c.—

Enterprise Mfg. Co.....20@25%
National list Jan. 1, 1902.....30%
Parker's Columbia and Victoria..33⅓%
Parker's Box and Side.....50&10%
Swift, Lane Bros. Co.....25%

Motors Water—

Divine's Red Devil.....30%

Mowers, Lawn—

NOTE.—Net prices are generally quoted
Cheapest.....*all sizes, $1.85@2.00*
Cheap.....*all sizes, $2.00@2.50*
Better Grade..*all sizes, $2.50@4.50*

	12	*14*	*16*	*18-in.*
High Grade	*$4.50*	*4.75*	*5.00*	*5.25*

Continental.....60%
Great American.....70%
Great American Ball B'r'g, new list.70%
Quaker City.....70%
Pennsylvania.....60%
Pennsylvania, Jr., Ball Bearing, 50&10&5%
Pennsylvania Golf.....50%
Pennsylvania Horse.....33⅓&5%
Pennsylvania Pony.....40&5%
Granite State:
Style A, Low Wheel.....70&10%
Style B, Low Wheel.....70&5%
Style C, High Wheel, spcl. discl.. 70&10%
Style D, High Wheel, spcl. discl.70%
Philadelphia:
Styles M., S., C., K., T....70&10&5%
Style A, all Steel.....60&10&5%
Style E, High Wheel.....70&10&5%
Drexel and Gold Coin, special list.40%
Horse.....40&5%
Pony.....40&5%
36-in. Horse.....30&10%
Eagle Horse.....30&5%
I. X. L. Horse.....50%

Nails—

Wire Nails and Brads, Miscellaneous.....*87½@87½&10%*
Cut and Wire. See *Trade Report.*
Hungarian, Finishing, Upholsterers' &c. See *Tacks.*

Horse—

Nos.	6	7	8	9	10	
Anchor	23	21	20	19	18	...40&5%
Coleman	13	12	12	11	11	.....net
New Haven	23	21	20	19	18	...40&5%
Livingston	19	18	17	16	16	.....10%

Western.....₱ lb 8½¢
Jobbers' Special Brands.....*per lb.9@10¢*

Picture—

1½	*2*	*2½*	*3*	*in.*
Brass H'd.45	*.55*	*.60*	*.70*	*..gro*
Por. Head..	*1.10*	*1.10*	*1.10*	*..gro*

Nippers—

See *Pliers and Nippers.*

Nuts—

Cold Punched: *Off list.*
Square, Blank or Tapped..*4.80¢*
Hexagon, Blank or Tapped..*5.10¢*
Square, Bl'k, C., T. & R...*5.10¢*
Hexagon, Bl'k, C., T. & R.5.70¢
Hot Pressed:
Square, Blank.....*5.00¢*
Hexagon, Blank.....*5.40¢*
Square, Tapped.....*4.70¢*
Hexagon, Tapped.....*5.10¢*

Oakum—

Best.....*lb., 6½¢*
U. S. Navy.....*lb., 6¢*
Navy.....*lb., 5¢*
Plumbers' Spun Oakum.....*3¾¢*
In carload lots ⅛¢ lb off, f.o.b. New York.

Oil Tanks—See *Tanks, Oil.*

Oilers—

Brass and Copper.....*50&10%*
Tin or Steel.....*65&10&5@70%*
Zinc.....*65&10&5@70%*
Chase or Paragon:
Brass and Copper.....*50&10%*
Tin or Steel.....*65&10%*
Zinc.....*65&10%*
Malleable, Hammers' Improved, Nos. 11, 12 and 13, 20%; Old Pattern, Nos. 1, 2, 3, 50%.
American Tube & Stamping Co.:
Spring Bottom Cans.....70@70&10%
Railroad Oilers, &c.....60@60&10%

Openers— Can— *Per doz.*

Sprague, Iron Handle....*30@35¢*
Sprague, Wood Handle...*35@40¢*
Sardine Scissors.....*$1.75@$3.00*
Yankee Can and Bottle Opener, ₱ doz., net, $0.75; Little Gem, ₱ doz., net.....$0.65

Egg—

Hartigan Nickel Plate, ₱ doz., $2.00; Silver Plate, $4.00.

Packing—

Asbestos Packing, Wick and Rope.....*20@25¢*

Rubber—

(Fair quality goods.)

Sheet, C. I.....*11@12¢*
Sheet, C. O. S.....*11@12¢*
Sheet, C. B. S.....*12@13¢*
Sheet, Pure Gum.....*40@45¢*
Sheet, Red.....*40@50¢*
Jenkins' '96, ₱ lb. 80¢.....25%

Miscellaneous—

American Packing...*lb. 7@10 ¢*
Cotton Packing.....*lb. 16@25 ¢*
Italian Packing.....*lb. 9@12½¢*
Jute.....*lb. 4@ 4½¢*
Russia Packing.....*lb. 8@11 ¢*

Pails, Water, Well, &c.—

See *Buckets.*

Pans— Dripping—

Standard List.....*65&7½@70%*
Edwards, Royal Blue.....65&7½%

Fry—

Common Lipped:

Nos.	*1*	*2*	*3*	*4*	*5*
Per doz.	*$0.75*	*0.80*	*0.90*	*1.10*	*1.30*

Refrigerator, Galva.—

Inch	*12*	*14*	*16*	*18*
Per doz	*$1.75*	*2.25*	*2.80*	*3.15*

Paper—Building Paper

Asbestos:	*lb.*
*Roll Board or Building Felt, 6 to 30 lb., per 100 sq. ft.*3½to5¢	
Roll Board or Building Felt, 3-32 and ⅛ in., 45 to 60 lb., per 100 sq. ft.....	*6¢*
Mill Board, Sheet, 40 x 40 in., 1-32 to ½ in.....	*3@5¢*
	Per roll
Rosin Sized Sheathing: 500 sq. ft. Light weight, 25 lbs. to roll	*40@50¢*
Medium weight, 30 lbs. to roll	*50@55¢*
Heavy weight, 40 lbs. to roll	*65@70¢*
Black Water Proof Sheathing, 500 sq. ft., 1 ply, 65¢; 2 ply, 85¢; 3 ply, $1.10; 4 ply, $1.25.	
Deafening Felt, 9, 6 and 4½ sq. ft. to lb. ton.....	*$50.00*
Red Rope Roofing, 250 sq. ft. per roll.....	*$1.75*

Tarred Paper—

1 ply (roll 400 sq. ft.), ton.... *$34.00@$38.00*
2 ply, roll 108 sq. ft.....*68¢*
3 ply, roll 108 sq. ft.....*98¢*
Slater's Felt (roll 500 sq. ft.)..*75¢*

Sand and Emery—

Flint Paper and Cloth.50&10@—%
Garnet Paper and Cloth....*25%*
Emery Paper and Cl'h..50&10@60%

Parers— Apple—

Goodell Co.:
Family Bay State.....₱ doz. $15.00
Improved Bay State.....₱ doz. $36.00
New Lightning.....₱ doz. $7.00
Turn Table '98.....₱ doz. $6.00
White Mountain.....₱ doz. $5.00
Bonanza Improved.....each $7.50
Dandy.....each $10.00
Eureka Improved.....each $20.00
New Century.....each $20.00
Ranger.....each $25.00
Livingston Nail Co.:
Daisy.....₱ doz. $4.00
Little Star.....₱ doz. $5.00
Rocking Table.....₱ doz. $6.20
Reading Hardware Co.:
Advance.....₱ doz. $4.00
Baldwin.....₱ doz. $4.00
Reading 72.....₱ doz. $3.25
Reading 78.....₱ doz. $6.25

Potato—

Saratoga.....₱ doz. $7.00
White Mountain.....₱ doz. $6.00

Picks and Mattocks—

List, Feb. 23, 1899..*70&5@70&10%*
Cronk's Handled Garden Mattock, ₱ doz., No. 2, $2.60; No. 3, $3.40.

Pinking Irons—
See *Irons, Pinking.*

Pins, Escutcheon—
Brass .....50@50&10%
Iron, list Nov. 11, '85..60@60&10%

Pipe, Cast Iron Soil—
Standard, 2-6 in.....50%
Extra Heavy, 2-6 in.....60%
Fittings, Stand. and H'vy...70%

Pipe, Merchant—
	Consumers, Carloads.			
	Steel.		*Iron.*	
	Blk.	*Galv.*	*Blk.*	*Galv.*
	%	%	%	%
¼ & ⅜ *in*...	61	48	57	41
½ *in*.....	66	52	59	41
½ *in*.....	68	56	61	49
¾ *to 6 in*....	72	62	66	56
7 to 12 in....	69	54	61	46

Pipe, Vitrified Sewer—
Carload lots.
Standard Pipe and Fittings, 3 to 24 in., f.o.b. factory:
First-class 82%
Second-class 85%
NOTE.—Market irregular.

Pipe, Stove—
	Per 100 joints.	
Edwards' Nested:	C. L.	L. C. L.
5 in., Standard Blue....	$6.25	$7.25
6 in., Standard Blue....	6.75	7.75
7 in., Standard Blue....	7.75	8.75
5 in., Royal Blue.....	7.00	8.00
6 in., Royal Blue.....	7.50	8.50
7 in., Royal Blue.....	8.50	9.50
Wheeling Corrugating Co.'s Nested:		
5 in., Uniform Color..	$6.15	$7.15
6 in., Uniform Color..	6.65	7.65
7 in., Uniform Color..	7.65	8.65

Planes and Plane Irons—
Wood Planes—
Bench, first qual.....30@30&10%
Bench, second qual...40@40&10%
Molding .....25@25&10%
Chapin-Stephens Co.:
Bench, First Quality.....30%
Bench, Second Quality.....40%
Molding and Miscellaneous.....25%
Toy and German.....30%
Union 60%

Iron Planes
Chaplin's Iron Planes.....50&10%
Union 60%

Plane Irons—
Wood Bench Plane Irons, list Dec. 12, '06.....25%
Buck Bros.....30%
Chapin-Stephens Co.....25%
Union 50%
L. & I. J. White.....20&5@25%

Planters, Corn, Hand—
Kohler's Eclipse.....per doz. $8.00

Plates—
Felloe .....lb. 4@4¼¢

Pliers and Nippers
Button Pliers.....75@75&10%
Gas Burner, per doz., 5 in., $1.25 @ $1.30; 6 in., $1.45 @ $1.50.
Gas Pipe..	*7*	*8*	*10*	*12-in.*
	$2.00	$2.25	$2.75	$3.50

Acme Nippers.....50&5%
Cronk & Carrier Mfg. Co.:
American Button.....80%
Improved Button.....75&10%
Cronk's 60%
No. 8 Linemen's.....50%
Stub's Pattern.....45%
Combination and others.....33⅓%
Heller's Farriers' Nippers, Pincers and Tools.....40&5@40&10&5%
P., S. & W. Tinners' Cutting Nippers 40%
Wm. Schollhorn Co.:
Bernard, 35%; Elm City, 35%; Paragon, 50%; Lodi, 55%.
Swedish Side, End and Diagonal Cutting Pliers.....50%
Utica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds.....40%

Plumbs and Levels—
Chapin-Stephens Co.:
Plumbs and Levels.....30@30&10%
Chapin's Imp. Brass Cor..40@40&10%
Pocket Levels.....30@30&10%
Extension Sights.....30@30&10%
Machinists' Levels.....40@40&10%
Disston's Plumbs and Levels....60&10%
Disston's Pocket Levels.....60&10%
Stanley's Duplex.....50%
Woods' Extension.....33⅓%

Points, Glaziers'—
Bulk and 1-lb. papers,.....lb. 10¢
½-lb. papers.....lb. 9@10½¢
¼-lb. papers.....lb. 9¾@11¢

Police Goods—
Manufacturers' Lists...25@25&5%
Tower's 25%

Polish—Metal, Etc—
Prestoline Liquid, No. 1 (½ pt.), per doz., $3.00; No. 2 (1 qu.), $9.00..40%
Prestoline Paste.....60%
George William Hoffman:
U. S. Metal Polish Paste, 3 oz. boxes, per doz. 50¢; per gro. $4.50; ½ lb boxes, per doz. $1.25; 1 lb boxes, per doz. $2.25.
U. S. Liquid, 8 oz. cans, per doz., $1.25.
Barkeepers' Friend Metal Polish, per doz., $1.75.

Stove—
Black Eagle Benzine Paste, 5 lb cans, per lb 10¢
Black Eagle, Liquid, ½ pt. cans.. per doz. 75¢
Black Jack Paste, ¾ lb cans, per gr. $9.00
Black Kid Paste, 5 lb can....each, $0.65
Ladd's Black Beauty Liquid, per 100 tins.....$6.75
Joseph Dixon's, per gr. $5.75.....10%
Dixon's Plumbago.....per lb 8¢
Fireside .....per gr. $2.50
Gem, per gr. $4.50.....10%
Japanese .....per gr. $3.50
Jet Black.....per gr. $3.50
Peerless Iron Enamel, 10 oz. cans.. per doz. $1.50

Poppers, Corn—
1 qt. Square..doz.$0.88; gro.$8.75
1 qt. Round..doz.$1.00; gro.$10.00
1½ qt. Square.doz.$1.10; gro.$11.00
2 qt. Square..doz.$1.35; gro.$13.50

Post Hole and Tree Augers and Diggers—
See also *Diggers, Post Hole, &c.*

Posts, Steel—
Steel Fence Posts, each, 5 ft., 42¢; 6 ft., 46¢; 6½ ft., 48¢.
Steel Hitching Posts.....each $1.30

Potato Parers—
See *Parers, Potato.*

Pots, Glue—
Enameled .....35&10%
Tinned .....30&10%

Powder—
In Canisters:
Duck, 1 lb.....each 45¢
Fine Sporting, 1 lb....each 75¢
Rifle, ½-lb.....each 15¢
Rifle, 1-lb.....each 25¢
In Kegs:
12½-lb. kegs.....$3.50
25-lb. kegs.....$4.50
King's Semi-Smokeless:
Keg (25 lb bulk).....$6.50
Half Keg (12½ lb bulk).....$3.50
Quarter Keg (6¼ lb bulk).....$1.90
Case 24 (1 lb cans bulk).....$8.50
Half case (1 lb cans bulk).....$4.50
King's Smokeless: Shot Gun. Rifle.
Keg (25 lb bulk).....$12.00 $15.00
Half Keg (12½ lb bulk)... 6.25 7.75
Quarter Keg (6¼ lb bulk). 3.25 4.00
Case 24 (1 lb cans bulk).. 14.00 17.00
Half case 12 (1 lb c. bk).. 7.25 8.75

Presses—
Fruit and Jelly—
Enterprise Mfg. Co.....20@25%

Seal Presses—
Morrill's No. 1, per doz., $20.00.....50%

Pruning Hooks and Shears
See *Shears.*

Pullers, Nail—
Cyclops 50%
Miller's Falls, No. 3, per doz., $12.00..
.....33⅓&10%
Morrill's No. 1, Nail Puller, per doz. $20.00 .....50%
Pearson No. 1, Cyclone Spike Puller, each $30.00.....50%
The Scranton Co, Case Lots:
No. 2B (large).....$5.50
No. 3B (small).....$5.00
Smith & Hemenway Co.:
Diamond B.....70%
Giant 50%
Staple Pullers, Utica and Davison 60%

Pulleys, Single Wheel—
Inch	*1½*	*1¾*	*2*	*3*
Awning or Tackle, doz.	$0.30	.45	.60	1.05
Hay Fork, Swivel or Solid Eye, doz., ¼ in., $1.25; 5 in., $1.55				
Inch	*2*	*2¼*	*2½*	
Hot House, doz....	$0.65	.85	1.20	
Inch	*1¼*	*1½*	*1¾*	*2*
Screw, doz....	$0.16	.19	.25	.30
Inch	*1¾*	*2*	*2¼*	*2½*
Side, doz.....	$0.25	.40	.55	.60
Inch	*1½*	*1¾*	*2*	*2½*

Sash Pulleys—
Common Frame; Square or Round End, per doz, 1¾ and 2 in.....17@20¢
Auger Mortise, no Face Plate, per doz., 1¾ and 2 in....20@21¢
Acme, No. 35..1¾ in., 19¢; 2 in., 20½¢
Fox-All-Steel, Nos. 3 and 7, 2 in.... per doz. 50%
Grand Rapids All Steel Noiseless..50%
Niagara, No. 25, 1¾ in., 19¢; 2 in.....20½¢
No. 26, Trov..1¾ in., 14½¢; 2 in., 16½¢
Star, No. 26..1¾ in., 19¢; 2 in., 20½¢
Tackle Blocks—See Blocks.

Pumps—
Cistern 60%
Pitcher Spout.....75&5@75&10%
Wood Pumps, Tubing, &c.....50%
Barnes Dbl. Acting (low list)....40&5%
Barnes Pitcher Spout.....75&5%
Contractors' Rubber Diaphragm No. 2, B. & L. Block Co.....$16.00
Daisy Spray Pump.....per doz. $6.50
Flint & Walling's, Fast Mail Hand, (low list).....50%
Flint & Walling's Fast Mail (low list) 50%
Flint & Walling's Tight Top Pitcher. .....75&10%
National Specialty Mfg. Co., Measuring, Nos. 2, $6.00; 3, $5.50.....30%
Myers' Pumps (low list).....45%
Myers' Power Pumps.....45%
Myers' Spray Pumps.....45%

Pump Leathers—
Lower Valve Leathers—Per gro.:				
Inch....	*2*	*2½*	*3*	*3½*	*4*
	$3.10	*3.70*	*4.35*	*4.95*	*5.60*
Crimped Plunger Leathers—Per 100:					
Inch.....	*2½*	*3*	*3½*	*4*	
	$4.15	*5.25*	*7.80*	*9.65*	

Punches—
Saddlers' or Drive, good..... doz. 50@75¢
Spring, single tube, good quality .....$1.75@2.00
Revolving (4 tubes)..... doz. $3.50@3.75
Bemis & Call Co.'s Cast St'l Drive.50%
Morrill's Nos. 1AA, 1A, 1B, 1C, 1D, $15.00.....50%
Hercules, 1 die, each $5.00.....50%
Niagara Hollow Punches.....40%
Niagara Solid Punches.....55&10%
Wm. Schollhorn Co.:
Belt and Ticket, Bernard, 35%; Paragon, 50%; Lodi.....55%
Tinners' Hollow, P., S. & W. Co..40%
Tinners' Solid, P., S. & W. Co., per doz., $1.44.....40%

Rail—Barn Door, &c.—
Sliding Door, Painted Iron.... 2½@2¾¢
Sliding Door, Wrought Brass, 1½ in., lb., 36¢.....30%
Allith Mfg. Co.: Reliable Hanger Track 50%
Cronk's:
Double Braced Steel Rail..per ft. 3¼¢
O. N. T. Rail.....$3.12
Griffin's:
xxx, per 100 ft., 1 x 3-16 in., $3.25; 1¼ x 3-16 in., $3.75.
Hinged Hanger, per 100 ft., 1 x 3-16 in., $3.50; 1¼ x 3-16 in., $4.00.
Lane's:
Hinged Track, per 100 ft. $3.45
O. N. T., per 100 ft., 1 in., $3.00; 1¼ in., $3.45; 1½ in., $4.00.
Standard, 1¼ in.....per 100 ft. $4.00
Lawrence Bros.:
1 x 3-16 in., per 100 ft., $7.50; 1¼ x 3-16 in., $8.75.....55&7½%
McKinney's:
Hinged Hanger Track, per ft., 11¢, 60&5%
1 x 3-16 Track.....55&7½%
Myers' Stayon Track.....60&5%
Richards' Mfg. Co.:
Common, 1 x 3-6 in., $3.00; 1¼ x 3-16, $3.25; 1¼ x 3-16, $3.50.
Special Hinged Hanger Rail...60&10%
Lag Screw Rail, No. 65.....50%
Gauge Trolley Track, per ft., No. 31. 9¢; No. 32, 14¢; No. 33, 20¢.
No. 50.....60&10%
Nos. 61, $3.00; 62, $3.25; 63, $3.50; 64, $4.00; 45, $3.25; 46, $3.50; 49, No. 1, $3.25; 49, No. 2, $3.50.

Rakes—
NOTE.—Many goods are sold at net prices.
Fort Madison Red Head Lawn....$3.25
Fort Madison Blue Head Lawn....$2.70
Cronk's:
Steel Garden: Champion, 75%; Ideal, 80%; Victor.....80&25%
Queen City Lawn, per doz., 20 teeth, $2.85; 24, $3.00.....net
Anticlog Lawn, per doz.....$4.00
Malleable Garden.....70&10%
Ideal Steel Garden, per doz., 12 teeth, $15.00; 14, $16.00; 16, $18.00.....80%
Kohler's:
Lawn Queen, 20-tooth....per doz, $3.15
Lawn Queen, 24-tooth....per doz, $3.25
Paragon, 20-tooth.....per doz, $2.70
Paragon, 24-tooth.....per doz, $2.75
Steel Garden, 14-tooth....per doz. $2.40
Malleable Garden, 14-tooth, per doz. $2.00@2.25

Rasps, Horse—
Disston's 75%
Heller Bros.'.....70&5@70&10&5%
Liveright Bros.' Gold Medal.70&10@75%
McCaffrey's American Standard. .....60&10&5%
New Nicholson.....70&10@75%
See also Files.

Razors—
Liana Bo-ras-le.....60%
Fox Razors, per doz., No. 42, $18.00; No. 44, $20.00; No. 82, Platina, $25.00. } Dis. 40%
Red Devil.....65%

Reels, Fishing—
Hendryx:
M 6, Q 6, A 6, B 6, M 9¼, M 16, Q 16, A 16, B 16, 4008, Rubber, Populo, Nickeled Populo.....20%
Aluminum German Silv., Bronze.25%
1240 N, 124 N.....20%
3004 N, 06 N, 6 RM, G 9.....25%
4 N, 6 PN, 24 N, 96 PN.....20%
2904 P, 33¼%; 2904 PN, 33¼%; 0924 N, 33¼%; 02084 N, 33¼%; 002904 PN, 33¼%; 802 N, 33¼%.
986 PN, 2901 N, 974 PN.....25%
5009 PN, 5009 N.....20%
Competitor 102 P, 102 PN, 202 P, 202 PN, 102 PR, 202 PR.....20%
304 P, 304 PN, 00304 P, 00304 PN.33¼%

Registers—*List July 1, 1903.*
Japanned, Electroplated and Bronzed 66⅔%
White Porcelain Enamel....60%
Solid Brass or Bronze Metal, 40&10%

Revolvers—
Single Action.....95¢@$1.00
Double Action, except 44 cal..$2.00
Double Action, 44 caliber....$2.00
Automatic $4.00
Hammerless $4.50

Riddles, Hardware Grade
16 in.....*per doz.*$2.50@$2.75
17 in.....*per doz.*$2.75@$3.00
18 in.....*per doz.*$3.00@$3.25

Rings and Ringers—
Bull Rings—
	2	*2½*	*3 inch.*
Steel	$0.70	0.75	0.80 *doz.*
Copper	$1.30	1.50	1.90 *doz.*

Hog Rings and Ringers—
Hill's Rings, gro. boxes....$4.25
Hill's Ringers, Gray Iron, doz..60¢
Hill's Ringers, Malleable Iron.. *doz.*.80¢
Blair's Rings.....*per gro.*$...
Blair's Ringers.....*per doz.*75¢
Brown's Rings.....*per gro.*$5.25
Brown's Ringers....*per doz.*75¢

Rivets and Burrs—
Copper .....33⅓@35%
Carriage, Coopers', Tinners, &c.:
Black .....70&10%
Metallic Tinned.....70%

Bifurcated and Tubular—
Assorted in Boxes.
Bifurcated, per doz. boxes, pasteboard boxes, 50 count, 32@36¢; Tin boxes, 100 count, 60@67¢.
Tubular, per doz. boxes, 50 count, 60@67¢; 100 count, $1.12@$1.26.

Rollers—
Cronk's Stay, No. 50.....$1.00
Cronk's Bracketoff, No. 55, $0.60; No. 56, $0.75; No. 60.....$0.75
Lane's Stay.....40%
Richards' Stay:
Handy Adj. and Reversible No. 53.75¢
O. K. Adj. and Reversible No. 58.50¢
Lag Screw, Nos. 55 and 57.....50%
Underwriters', Nos. 59, 60.....50%
Favorite, No. 54.....60%

Rope—
Manila, 7-16 in. diam. and larger: Pure .....lb., 13@13½¢
Sisal, 7-16 in. diam. and larger: Pure .....lb., 9¼¢
Sisal, 7-16 in. diam. and larger: No. 2 quality.....lb., 7¾@8¢
Sisal, Hay, Hide and Bale Ropes, Medium and Coarse: Mixed .....lb., 7¾@8¢
Pure .....lb., 9¼¢
Sisal, Tarred, Medium Lath Yarn, Coarse and Untarred: Mixed .....lb., 7@7½¢
Pure .....lb., 8¢
Cotton Rope: Best, ¼-in. and larger...18@20¢
Medium, ¼-in. and larger.16@17¢
Common, ¼-in. and larger..10¢
In coils, ½¢ advance.
Jute Rope: Thread, No. 1, ¼-in. & up, lb., 9¢
Thread, No. 2, ¼-in. & up, lb., 8½¢

Wire Rope—
Galvanized .....37½&2½%
Plain .....35&2½%

Ropes, Hammock—
Covert Mfg. Co.:
Jute, 35%; Sisal.....20%

Rules
Boxwood .....60@60&10%
Ivory .....35&10@35&10&5%
Chapin-Stephens Co.:
Boxwood 60%
Flexifold 40%
Ivory .....25@25&10%
Miscellaneous.....50@50&10%
Stephens' Combination.....55%
Stationers' .....50@50&10%
Keuffel & Esser Co.:
Folding, Wood.....35&10%
Folding, Steel.....33⅓&10%
Lufkin's Steel.....50&10%
Lufkin's Lumber.....50&10%
Upson Nut Co.:
Boxwood .....60@60&10%
Ivory .....35&10@35&10&10%

Sash Balances—
See *Balance, Sash.*

Sash Locks—See *Locks, Sash.*

Sash Weights—
See *Weights, Sash.*

Sausage Stuffers or Fillers
See *Stuffers or Fillers, Sausage.*

Saw Frames—
See *Frames, Saw.*

Saw Sets—See *Sets, Saw.*

Saw Tools—See *Tools, Saw.*

Saws—

Atkins':
Circular 45%
Band ..... 50@50&10%
Butcher Saws 50%
Cross Cuts 35%
One-Man Cross Cut 40%
Narrow Cross Cut 50%
Hand, Rip and Panel ..... 35&5%
Miter Box and Compass 40%
Mulay, Mill and Drag 45%
Wood Saws ..... 40&10%
Chapin-Stephens Co.:
Turning Saws and Frames..30@30&10%
Diamond Saw & Stamping Works:
Sterling Kitchen Saws....30&10&10%
Disston's:
Circular, Solid and Ins'ted Tooth.50%
Band, 2 to 18 in. wide 60%
Band, ¼ to 1¾ 60%
Crosscuts 45%
Narrow Crosscuts 50%
Mulay, Mill and Drag 50%
Framed Woodsaws 25%
Woodsaw Blades 25%
Woodsaw Rods, Tinned 15%
Hand Saws, Nos. 12, 99, 9, 16, d100, D8, 120, 76, 77, 8 ..... 25%
Hand Saws, Nos. 7, 107, 107½, 3, 1, 0, 00, Combination 30%
Compass, Key Hole, &c. 25%
Butcher Saws and Blades 30%
C. E. Jennings & Co.'s:
Back Saws 16%
Butcher Saws ..... 25&7½%
Compass and Key Hole Saws, 33⅓&7½%
Framed Wood Saws ..... 25&7½%
Hand Saws 12½%
Wood Saw Blades ..... 33⅓&7½%
Millers Falls:
Butcher Saws ..... 15&10%
Star Saw Blades ..... 15&10%
Massachusetts Saw Works:
Victor Kitchen Saws ..... 40&10&50%
Butcher Saws Blades ..... 35@40%
Peace & Richardson's Hand Saws...30%
Simonds':
Circular Saws 45%
Crescent Ground Cross Cut Saws..30%
One-Man Cross Cuts ..... 40&10%
Gang Mill, Mulay and Drag Saws.45%
Band Saws 50%
Back Saws ..... 25@25&7½%
Butcher Saws ..... 35@35&7½%
Hand Saws ..... 25@25&7½%
Hand Saws, Bay State Brand 45%
Compass, Key Hole, &c. ..... 25@25&7½%
Wood Saws ..... 40&7½%
Wheeler, Madden & Clemson Mfg. Co.'s Cross Cut Saws 50%

Hack Saw Blades and Frames—

Atkins' Hack Saw Blades A A A..25%
Disston's:
Concave Blades 25%
Keystone Blades 35%
Hack S Frames 30%
Simonds File Co. 35%
C. E. Jennings & Co.'s:
Hack Saw Frames, Nos. 175, 180 ..... 40&7½%
Hack Saws, Nos. 175, 180, complete, 40&7½%
Goodell's Hack Saw Blades ..... 40&10%
Griffin's Hack Saw Frames..35&5&10%
Griffin's Hack Saw Blades....35&5&10%
Star Hack Saws and Blades ..... 15&10%
Sterling Hack Saw Blades....30&10&5%
Sterling Hack Saw Frames..30&10&10%
Sterling Power Hack Saw Machines, each, No. 1, $25.00; No. 2, $30.00..10%
Victor Hack Saw Blades 20%
Victor Hack Saw Frames 40%

Scroll—

Barnes, No. 7, $15 ..... 25%
Barnes' Scroll Saw Blades 40%
Barnes' Velocipede Power Scroll Saw, without boring attachment, $18; with boring attachment, $20 ..... 25%
Lester, complete, $10.00 ..... 15&10%
Rogers, complete, $3.50 and $4.00.. 15&10%

Scales—

Family, Turnbull's ..... 50@50&10%
Counter:
Hatch, Platform, ½ oz. to 4 lbs. ..... doz. $5.50
Two Platforms, ½ oz. to 8 lbs. ..... doz. $18.00
Union Platform, Plain..$1.70@1.90
Union Platform, Stpd..$1.85@2.15
Chatillon's:
Eureka 25%
Favorite 40%
Grocers' Twin Scales 50%
The Standard Portables 40%
The Standard R. R. and Wagon ..... 50&10%

Scrapers—

Box, 1 Handle ..... doz. $2.00@2.25
Box, 2 Handle ..... doz. $3.50@3.60
Ship ..... Light, $2.00; Heavy, $4.50
Chapin-Stephens Co., Box...30@30&10%
Richards Mfg. Co., Foot 60%

Screws—Bench and Hand

Bench, Iron, doz., 1 in., $2.50@2.75; 1¼, $3.00@3.25; 1¼, $3.50@3.75
Bench, Wood ..... 20@20&10%
Hand, Wood ..... 70&10@70&10&10%
Chapin-Stephens Co., Hand ..... 70@70&10&2½%

Coach, Lag and Hand Rail—

Lag, Cone Point, list Oct. 1, '99 ..... 75&10%
Coach, Gimlet Point, list Oct. 1, '99 ..... 75&10%
Hand Rail, list Jan. 1, '81 ..... 70&10@75%

Jack Screws—

Standard List ..... 70&10@75%
Millers Falls ..... 50&10&10%
Swett Iron Works ..... 70@75%

Machine—

List Jan. 1, '98:
Flat or Round Head, Iron, Brass or Bronze ..... 50@50&10%
Fillister Head, Iron, Brass or Bronze ..... 40@40&10%

Set and Cap—

Set (Iron) ..... 75&10&7½%
Set (Steel), net advance over Iron 25%
Sq. Hd. Cap ..... 70&10&7½%
Hex. Hd. Cap ..... 70&10&7½%
Rd. Hd. Cap ..... 50&7½%
Fillister Hd. Cap ..... 60&7½%

Wood—

List July 23, 1903.
Flat Head, Iron ..... 87½&5@.. %
Round Head, Iron ..... 85&5@.. %
Flat Head, Brass ..... 80&5@.. %
Round Head, Brass ..... 77½&5@.. %
Flat Head, Bronze ..... 75&5@.. %
Round Head, Bronze..72½&5@.. %
Drive Screws ..... 87½&5@.. %

Scroll Saws—

See *Saws, Scroll.*

Scythes—

Per doz.

Grass, No. 1, Plain ..... $6.25@6.75
Clipper, Bronzed Webb..$6.50@7.00
No. 3 Clipper, Pol'd Webb.. $6.75@7.25
No. 6 Clipper and Solid Steel, $7.00@7.50
Bush, Weed and Bramble, No. 2. $6.50@7.00
Grain, No. 1 ..... $8.25@8.75
Bronzed Webb, No. 1..$8.50@9.00
Nos. 3 and 4 Clipper, Grain.. $8.75@9.25
Solid Steel, No. 6 ..... $9.25@9.75

Seeders, Raisin—

Enterprise ..... 25@30%

Sets— Awl and Tool—

Fray's Adj. Tool Handles, Nos. 1, $12; 2, $18; 3, $12; 4, $9; 5, $7 ..... 50%
Millers Falls Adj. Tool Handles, No. 1, $12; No. 4, $12; No. 5, $18..20&10%

Garden Tool Sets—

Ft. Madison Three Plows, Hoe, Rake and Shovel ..... ℔ doz sets $9.00

Sets, Nail—

Octagon ..... gro. $3.50@3.75
Buck Bros. 27½%
Cannon's Diamond Point, ℔ gro, $12, 40&10%
Mayhew's ..... ℔ gro. $9.00
Snell's Corrugated, Cup Pt. ..... 40&10%
Snell's Knurled, Cup Pt. ..... 40&10%
Victor Knurled Cup Pt. ..... ℔ gro. $7.50

Rivet—

Regular list ..... 75@75&10%

Saw—

Atkin's:
Criterion 40%
Adjustable 40%
Disston's Star, Monarch and Triumph 30%
Morrill's No. 1 ..... $15.00
Nos. 3 and 4, Cross Cut $20.60
No. 5, Mill $30.00
Nos. 10, 11, 95 ..... $15.60
No. 1 Old Style $10.00
Special $16.25
Giant Royal Cross Cut ..... ℔ doz. $8.00
Royal, Hand ..... ℔ doz. $4.80
Taintor Positive ..... ℔ doz. $4.75

Shaving—

Fox Shaving Sets, No. 20 ..... ℔ doz., net, $24.00
Smith & Hemenway Co.'s 75%

Sharpeners, Knife—

Pike Mfg. Co.:
Fast Cut Pocket Knife Hones, ℔ doz. $1.50
Mounted Kitchen Sand Stone, ℔ doz. $1.50
Natural Grit Carring Knife Hones, ℔ doz. $3.00
Quick Cut Emery Carving Knife Hones, ℔ doz. $1.50
Quick Edge Pocket Knife Hones, ℔ doz. $2.50

Skate—

Smith & Hemenway Co., Eureka..50%

Shaves, Spoke—

Iron ..... doz. $1.10@1.25
Wood ..... doz. $1.75@2.25
Bailey's (Stanley R. & L. Co.) 45%
Chapin-Stephens Co. ..... 30@30&10%
Goodell's, ℔ doz. $9.00 ..... 15&10%

Shears—

Cast Iron..	*7*	*8*	*9 in.*	
Best	*$16.00*	*18.00*	*20.00*	*gro.*
Good	*$13.00*	*15.00*	*17.00*	*gro.*
Cheap	*$5.00*	*6.00*	*7.00*	*gro.*

Straight Trimmers, &c.:
Best quality Jap ..... 70@70&10%
Best quality, Nickel ..... 60@60&10%
Tailors' Shears ..... 40@40&10%
Acme Cast Shears ..... 40@40&5%
Heinisch's Tailor's Shears 10%
Wilkinson Shear & Cutlery Co.:
Sheep, 1900 list ..... 30&10&5%
Grass ..... 50&10%
Horse or Mule ..... 50&10%

Tinners' Snips—

Steel Blades ..... 20&5@20&10%
Steel Laid Blades ..... 40&10@50%
Forged Handles, Steel Blades, Berlin 50%
Heinisch's Snips 40%
Jennings & Griffin Mfg. Co.'s 6½ to 10 in. ..... 33⅓&7½%
Niagara Snips 40%
P. S. & W. Forged Handles, 25%; W. R. W. ..... 40&10%

Pruning Shears—

Cronk's Hand Shears 33⅓%
Cronk's Wood Handle Shears 33⅓%
Disston's Combined Pruning Hook and Saw, ℔ doz. $18.00 ..... 25%
Disston's Pruning Hook only, ℔ doz., $12.00 ..... 25%
John T. Henry Mfg. Co.:
Pruning Shears, all grades 40%
P. S. & W. Co. ..... 40&10%
Columbian Cutlery Co.:
Hedge, Wilcut Brand ..... 60&10%
Lawn and Border, Wilcut Brand, 60&10%

Sheaves— Sliding Door—

Reading 40%
R. & E. list 15%

Sliding Shutter—

Reading list 40%
R. & E. list 10%

Shells—Shells, Empty—

Brass Shells, Empty:
Climax, 10 and 12 gauge ..... 65&10%
Club, Rival, 65&5%; First Quality, 60&5%

Paper Shells, Empty:
New Rapid, 10, 12, 16 and 20 gauge, 25&10%
Climax, 10 and 12 gauge; Acme, 10, 12, 16 and 20 gauge; Ideal, 10, 12, 16 and 20 gauge; Leader grade, 25&5%
Union, League, 12 and 12 gauge; Rival Grade 25%
New Climax, Defiance, 10, 12, 14, 16 and 20 gauge; Climax, 14, 16 and 20 gauge ..... 20&5%
Challenge, Monarch, 10, 12, 16 and 20 gauge; League, Union, 14, 16 and 20 gauge; Repeater Grade..20%
Expert, 10, 12, 16 and 20 gauge, 33⅓&5%

Shells, Loaded—

Loaded with Black Powder..40%
Loaded with Smokeless Powder, medium grade ..... 40&5%
Loaded with Smokeless Powder, high grade ..... 40&10&10%
Union Metallic Cartridge Co.:
New Club, Black Powders 40%
Nitro Club, Smokeless Powders.40&5%
Arrow, Smokeless Powders.40&10&10%
Winchester:
Smokeless Repeater Grade ..... 40&5%
Smokeless Leader Grade...40&10&10%
Black Powder 40%

Shingles, Metal— Per Sq.

Edwards Mfg. Co.:

	Painted.	Galv.
14 x 20	$4.25	$6.00
10 x 14	4.50	6.25
7 x 10	4.75	6.50

Wheeling Corrugating Co.:

Dixie, 14 x 20 in.	$4.25	$5.50
Dixie, 10 x 14 in.	4.50	6.00
Dixie, 7 x 10 in.	5.00	6.75

Shoes, Horse, Mule, &c.—

F.o.b. Pittsburgh:
Iron ..... per keg. $4.10
Steel ..... per keg. $3.85
Burden's, all sizes ..... ℔ keg $3.90

Shot—

25-lb. bag.
Drop, up to B $1.90
Drop, B and larger 2.15
Buck 2.15
Chilled 2.15
Dust 2.40

Shovels and Spades—

Association List, Nov. 15, 1902..40%
Avery Stamping Co. 40%

Snow Shovels—

Long Handle ..... $3.25@$3.50
Wood and Mall, D. Handle, $3.75@$4.00

Sieves and Sifters—

Hunter's Imitation ..... gro. $9.50@10.00
Hunter's Genuine ..... per gro. $12.00@12.50

Sieves, Seamless Metallic

	—Per dozen.—			
Mesh	*14*	*16*	*18*	*20*
Iron Wire	*$1.05*	*1.05*	*1.10*	*1.20*
Tinned Wire	*$1.15*	*1.15*	*1.20*	*1.30*

Sieves, Wooden Rim—

Nested, 10, 11 and 12 Inch.
Mesh 18, Nested ..... doz. $0.90@0.95
Mesh 20, Nested ..... doz. $1.00@1.05
Mesh 24, Nested ..... doz. $1.30@1.40

Sinks, Cast Iron—

Painted, Standard list:
12 x 12 to 22 x 36 in 60%
20 x 40 to 24 x 50 in 50%
24 x 60 to 24 x 120 in 30%
Barnes' low list:
Up to and including 20 x 36 in....50%
20 x 40 to 24 x 50 in 45%

NOTE.—There is not entire uniformity in lists used by jobbers.

Skeins, Wagon—

Cast Iron ..... 70@75&10%
Steel ..... 40@45%

Slates, School—

Factory Shipments.
"D" Slates ..... 30@50&10%
Eureka, Unexcelled Noiseless .. 60&5 tens
Victor A, Noiseless..60&5 tens &5%

Slaw Cutters—See *Cutters.*

Snaps, Harness—

German ..... 40@40&10%
Covert Mfg. Co.:
Derby, 25%; Yankee, 30&2½; Yankee Roller, 30&2½
High Grade, 40%; Trojan 40%
Jockey 25%

Snaths—

Scythe 50%

Snips, Tinners—See *Shears.*

Spoons and Forks—

Silver Plated—

Good Quality ..... 50&10@60&5%
Cheap ..... 60@60&10%
International Silver Co.:
1847 Rogers Bros., 40&10%; Rogers & Hamilton ..... 50&10%
Rogers & Bro., William Rogers' Eagle Brand ..... 50&10%
Anchor, Rogers Brand 60%
Wm. Rogers & Son ..... 60&10%

Miscellaneous

German Silver ..... 60@60&5%

Tinned Iron—

Teas ..... per gro. 50@55¢
Tables ..... per gro. $0.90@$1.00

Springs— Door—

Bardsley's Spring and Check 40%
Chicago (Coil) ..... 40&10%
Gem (Coil) 20%
Pullman (Coil) 35%
Reliance (Coil) ..... 40&10%
Star (Coil) 30%
Torrey's Rod, 39 in. ..... ℔ doz. $1.10

Carriage, Wagon, &c.—

1¼ in. and Wider: Per 100 lb.
Black ..... $4.75@$5.00
Half Bright ..... $4.75@$5.00
Bright ..... $5.25@$5.50
Painted Seat Springs:
1½ x 2 x 26 ..... per pr. 47@49¢
1½ x 3 x 28 ..... per pr. 69@71¢

Sprinklers, Lawn—

American Foundry & Mfg. Co.:
Cactus, 65%; Japanese, 70%; National, ℔ doz. $12.00
Enterprise ..... 25@30%
Philadelphia No. 1, ℔ doz. $12; No. 2, $15; No. 3, $20 ..... 30%

Squares—

Nickel plated .. List Jan. 5, 1900.
Steel and Iron .. 75&10%
Rosewood Hdl. Try Square and T-Bevels ..... 60&10&10@70%
Iron Hdl. Try Squares and T-Bevels ..... 40&10@40&10&10%
Disston's Try Squares and Bevels, Rosewood Handle, 60&10%; Iron Stock and Bevel 15%

Squeezers, Lemon

Wood, Common, gro., No. 0, $5.25@$5.50; No. 1, $6.25@$6.50.
Wood, Porcelain Lined:
Cheap ..... doz. $1.00
Good Grade ..... doz. $1.25
Tinned Iron ..... doz. $0.75@1.25
Iron, Porcelain Lined ... doz. $1.75

Staples—

Barbed Blind ..... lb. 6@6½¢
Electricians', Association list .. 80&10&10&10%
Fence Staples, Plain, $2.25; Galvanized $2.55
Poultry Netting Staples ..... per lb. 3¼@3½¢

Steels, Butchers'—

Dick's 30%
Foster Bros. 30%

Steelyards— ..... 50@30&10%

Stocks and Dies—

Blacksmiths' ..... 50@50&10%
Curtis Rev'ble Ratchet Die Stock..25%
Derby Screw Plates 25%
Green River 25%
Lightning Screw Plate 25%
Little Giant 25%
Reece's New Screw Plates 25%

Stoners, Cherry—

Enterprise ..... 25@30%

Stones—Oil, &c.

Pike Mfg. Co., 1907 list:	℔ lb
Arkansas St. No. 1, 3 to 5½ in.	$2.80
Arkansas St. No. 1, 5½ to 8 in.	$3.50
Arkansas Slips No. 1	$4.00
Lily White Washita, 4 to 8 in.	60¢
Rosy Red Washita, 4 to 8 in.	60¢
Washita St., Extra, 4 to 8 in.	50¢
Washita St., No. 1, 4 to 8 in.	40¢
Washita St., No. 2, 4 to 8 in.	25¢
Lily White Slips	90¢
Rosy Red Slips	90¢
Washita Slips, Extra	80¢
Washita Slips, No. 1	70¢
Washita Slips, No. 2	40¢
India Oil Stones (entire list)	33⅓%
Quickcut Emery and Corundum Oil Stone, Double Grit	40%
Quickcut Emery and Corundum Axe Stone, Double Grit	33⅓%
Quickcut Emery Rubbing Bricks	40%
Hindostan No. 1, R'g'lar	℔ 8¢
Hindostan No. 1, Small	℔ 10¢
Axe Stones (all kinds)	33⅓%
Turkey Oil Stones, Extra, 5 to 8 in.	℔ 80¢
Queer Creek Stones, 4 to 8 in.	20¢
Queer Creek Slips	40¢
Sand Stone	6¢

Scythe Stones—

Pike Mfg. Co., 1901 list:
Black Diamond S. S., ₱ gro. $12.00
Lamoille S. S., ₱ gro. $11.00
White Mountain S. S., ₱ gro. $9.00
Green Mountain S. S., ₱ gro. $6.00
Extra Indian Pond S.S., ₱ gro. $7.50
No. 1 Indian Pond S.S., ₱ gro. $7.00
No. 2 Indian Pond S.S., ₱ gro. $4.50
Leader Red End S. S., ₱ gro. $4.50
Quick Cut Emery, ₱ gro. $10.00
Pure Corundum, ₱ gro. $18.00
Crescent $7.00
Emery Scythe Rifles, 2 Coat, $8
Emery Scythe Rifles, 3 Coat, $10
Emery Scythe Rifles, 4 Coat, $12
Balance of 1904 list 33⅓%
Electro (Artificial), ₱ gro., $12.00 ..... 33⅓%
Lightning (Artificial), ₱ gro., $18.00 ..... 33⅓%

Stoppers, Bottle—

Victor Bottle Stoppers..... ₱ gro. $9.00

Stops— Bench—

Millers Falls..... 15&10%
Morrill's, ₱ doz., No. 1, $10.00..... 50%
Morrill's, No. 2, $12.50..... 50%

Door—

Chapin-Stephens Co..... 50@50&10%

Plane—

Chapin-Stephens Co..... 20%

Straps— Box—

Cary's Universal, case lots....20&10&10%

Stretchers, Carpet—

Cast Iron, Steel Points, doz. 60@60&10%
Socket ..... doz. $1.60
Excelsior Stretcher and Tack Hammer Combined, ₱ doz. $6.00..... 20%

Stuffers, Sausage—

Enterprise Mfg. Co..... 25@25&7½%
National Specialty Co., list Jan. 1, 1902 ..... 30&5%
P., S, & W. Co..... 40&10&5%

Sweepers, Carpet—

Bissell Carpet Sweeper Co.: ₱ doz.
Superba, Crotch Mahogany..... $36.00
Triumph, Fancy Veneers..... $33.00
Parlor Queen, Fig. Rosewood. $30.00
Elite, Hungarian Ash..... $29.00
Am. Queen, Fig. Mahogany.... $27.00
Ideal, Bird's-Eye Maple..... $25.00
Grand Rapids, Nickel, $24.00; Japan $22.00
Standard, Nickel, $22.00; Japan. $20.00
Crown Jewel, Nickel, $21.00; Jap. $19.00
Crystal, Glass Top..... $36.00
Grand, 17 in. wide..... $36.00
Club, 24 in. wide..... $54.00
Hall, 28 in. wide..... $60.00

NOTE.—Rebates, 50c per dozen on three dozen lots; $1 per dozen on five-dozen lots; $2 per dozen on ten-dozen lots; $2.50 per dozen on twenty-five dozen lots.

Tacks, Finishing Nails, &c.

American Carpet Tacks... 90&62½%
American Cut Tacks..... 90&62½%
Swedes' Cut Tacks..... 90&62½%
Swedes' Upholsterers'.... 90&62½%
Gimp Tacks..... 90&62½%
Lace Tacks..... 90&62½%
Trimmers' Tacks..... 90&62½%
Looking Glass Tacks..... 65%
Bill Posters' and Railroad Tacks, 90&40%
Hungarian Nails..... 80&10%
Finishing Nails..... 70%
Trunk and Clout Nails..... 80%

NOTE.—The above prices are for Standard Weights.

Miscellaneous—

Double Pointed Tacks..... 90¢ ₱ or 5 tens

See also Nails, Wire.

Tanks, Oil and Gasoline—

Wilson & Friend Co.:

Gal.	Gasoline	Oil
30	$2.75	$3.00
60	3.50	4.00
110	5.00	5.75

Tapes, Measuring—

American Asses' Skin .. 50@—%
Patent Leather..... 25@50&5%
Steel ..... 33 1-3&5%
Chesterman's ..... 25@25&5%
Keuffel & Esser Co.:
Favorite, Ass Skin..... 40&10@50%
Favorite, Duck and Leather..... 25&5@25&10%
Metallic and Steel, lower list, 35@35&5%; Pocket, 35@35&5%.
Lufkin's:
Asses' Skin..... 40&10@50%
Metallic ..... 30@30&5%
Patent Bend, Leather.... 25&5@25&10%
Pocket ..... 40@40&5%
Steel ..... 33⅓@35%
Wiebusch & Hilger:
Chesterman's Metallic, No. 34L, etc. 25%
Chesterman's Steel, No. 1038L, etc. 35%

Teeth, Harrow—

Steel Harrow Teeth, plain or headed, ⅝-inch and larger... per 100 lbs. $2.75@$3.00

Thermometers—

Tin Case..... 80&10@80&10&5%

Ties, Bale—Steel Wire—

Single Loop..... 80&10&5%
Monitor, Cross Head, &c. 70&2½%

Tinners' Shears, &c.—

See *Shears, Tinners', &c.*

Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.

Tire Benders, Upsetters, &c.

See *Benders and Upsetters, Tire.*

Tools—Coopers'—

L. & I. J. White..... 20@20&5%

Haying—

Myers' Hay Tools..... 45%

Miniature—

Smith & Hemenway Co.'s, Davidson, ₱ doz., Nickel Plated, $1.50; Gold Plated..... $2.00

Saw—

Atkins' Cross Cut Saw Tools....35&5%
Simonds' Improved..... 33⅓%
Simonds' Crescent..... 25%

Ship—

L. & I. J. White..... 25%

Transom Lifters—

See *Lifters, Transom.*

Traps—Fly—

Balloon, Globe or Acme, doz. $1.15@$1.25; gro.... $11.50@12.00
Harper, Champion or Paragon, doz. $1.25@1.40; gro. $13.00@13.50

Game—

Imitation Oneida..... 70&10%
Newhouse ..... 45@45&5%
Hawley & Norton..... 65%
Victor ..... 70&10%
Oneida Community Jump..... 50%

Mouse and Rat—

Mouse, Wood, Choker, doz. holes 12¢
Mouse, Round or Square Wire, doz. 85@90¢
Marty French Rat and Mouse Traps (Genuine):
No. 1, Rat, ₱ doz., $13.25; case of 24 ..... $11.50 doz.
No. 3, Rat, ₱ doz., $6.50; case of 50 ..... $5.75 doz.
No. 3½, Rat, ₱ doz. $5.25; case of 72 ..... $4.70 doz.
No. 4, Mouse, ₱ doz. $3.95; case of 150 ..... $3.00 doz.
No. 5, Mouse, ₱ doz. $3.00; case of 180 ..... $2.25 doz.

Trowels—

Disston Brick and Pointing..... 25%
Disston Plastering..... 30%
Disston "Standard Brand" and Garden Trowels..... 30%
Kohler's Steel Garden Trowels, ₱ gro., 5 in., $4.80; 6 in., $6.00.
Never-Break Steel Garden Trowels, ₱ gro. $6.00
Woodrough & McParlin, Plastering. 25%

Trucks, Warehouse, &c.—

B. & L. Block Co.:
New York Pattern..... 50&10%
Western Pattern..... 60&10%
Handy Trucks..... ₱ doz. $16.00
Grocery ..... ₱ doz. $15.00
McKinney Trucks..... each, net $10.00
Model Stove Trucks..... ₱ doz. $18.50

Tubs, Wash—

M'f'gr's list, price per gross.

No.	0	1	2	3
Galvanized.	$67	$79	$89	$99	10%

Twine, Miscellaneous—

Flax Twine:
No. 9, ¼ and ½-lb. Balls. 23@25¢
No. 12, ¼ and ½-lb. Balls. 21@22¢
No. 18, ¼ and ½-lb. Balls. 18@20¢
No. 24, ¼ and ½-lb. Balls. 17@19¢
No. 36, ¼ and ½-lb. Balls. 16@18¢
Chalk Line, Cotton ¼-lb. Balls ..... 26@31¢
Cotton Mops, 6, 9, 12 and 15 lb. to doz ..... 11@19¢
Cotton Wrapping, 5 Balls to lb., according to quality... 15½@23¢
American 2-Ply Hemp, ¼ and ½-lb. Balls..... 14½@15½¢
American 3-Ply Hemp, 1-lb. Balls ..... 15½@16½¢
India 2-Ply Hemp, ¼ and ½-lb. Balls (Spring Twine) .10½@11½¢
India 3-Ply Hemp, 1-lb. Balls 10½@11½¢
India 3-Ply Hemp, 1½-lb. Balls. 10@11¢
2, 3, 4 and 5-Ply Jute. ¼-lb. Balls ..... 13½@14½¢
Mason Line, Linen, ½-lb. Bls. 47¢
No. 26½ Mattress, ¼ and ½-lb. Balls, according to quality, 30@60¢
Wool, 3 to 6 ply...B 9¢; A 10¢

Vises—

Solid Box..... 50@50&10%

Parallel—

Athol Machine Co.:
Simpson's Adjustable..... 40%
Standard 40%
Amateur 25%
Columbian Hdw. Co..... 40%
Fisher & Norris Double Screw, net, each, Nos. 2, $10.50; 3, $16.00; 4 $20.50; 5, $27.00.
Fulton Mach. & Vise Co.:
Reed, Swivel..... 25%
Star, Solid Jaw..... 40%
Hollands':
Machinists' ..... 40@40&5%
Keystone ..... 65&10@70%
Lewis Tool Co.:
Adjustable Jaw..... 30%
Monarch, 50%; Solid Jaw..... 50%
Massey Vise Co.:
Clincher 40%
Perfect, 15%; Lightning Grip..... 15%
Merrill's 20%
Millers Falls Oval Slide Pattern. 60&10%
Parker's:
Victor, 20@25%; Regulars..... 20@25%
Vulcan's ..... 40@45%
Combination Pipe..... 55@60%
Prentiss ..... 20@25%
Rock Island 25%
Snediker's X. L..... 33⅓%
Stephens' 33⅓%

Saw Filers—

Disston's D 3 Clamp and Guide, ₱ doz., $24.00, 30%; Clamps..... 30%
Perfection Saw Clamps, ₱ doz.... $4.50
Reading 60%

Wood Workers—

Fulton Mach. & Vise Co.:
Reed 25%
Star 40%
Massey Vise Co.:
Lightning Grip, 15%; Perfect..... 15%
Wyman & Gordon's Quick Action, 6 in., $6.00; 9 in., $7.50; 14 in., $8.00.

Miscellaneous—

Holland's Combination Pipe..60@60&5%
Massey's Quick Action Pipe..... 40%
Parker's Combination Pipe: 87 Series, 60%; 187 Series, 60&5%; No. 870 40%.
Rock Island Pipe..... 25%

Wads—*Price per M.*

B. E., 11 up	60¢
B. E., 9 and 10	70¢
B. E., 8	80¢
B. E., 7	80¢
P. E., 11 up	$1.00
P. E., 9 and 10	1.25
P. E., 8	1.50
P. E., 7	1.50
Ely's B. E., 11 and larger	$1.70@1.75
Ely's P. E., 12 to 20	$3.00@3.25

Dis. 15%

Ware, Hollow—Cast Iron, Hollow—

Stove Hollow Ware:
Enameled ..... 45&10%
Ground ..... 50&5%
Plain or Unground..... 60%
Country Hollow Ware, per 100 lbs. $3.00
White Enameled Ware:
Maslin Kettles..... 65&10%
Covered Wares:
Tinned and Turned..... 35&10%
Enameled ..... 45&10%
See also *Pots, Glue.*

Enameled—

Agate Nickel Steel Ware..... 33⅓%
Iron Clad Ware..... 70&10%
Lava and Volcanic, Enameled..40&10%

Tea Kettles—

Galvanized Tea Kettles:

Inch	6	7	8	9
Each	45¢	50¢	55¢	65¢

Steel Hollow Ware—

Avery Spiders and Griddles..65@65&5%
Avery Kettles..... 60%
Porcelained ..... 50&5@50&10%
Never Break Spiders and Griddles.. 65&5%
Never Break Kettles..... 60%
Solid Steel Spiders and Griddles.65&5%
Solid Steel Kettles..... 60%

Warmers, Foot—

Pike Mfg. Co., Soapstone....40@40&10%

Washboards—

Solid Zinc: ₱ doz.
Crescent, family size, bent frame.$4.05
Red Star, family size, stationary protector $4.05
Double Zinc Surface:
Saginaw Globe, family size, stationary protector..... $3.55
Cable Cross, family size, stationary protector..... $3.60
Single Zinc Surface:
Naiad, family size, open back, perforated $3.00
Single Saginaw Globe..... $2.85
Brass Surface:
Brass King, Single Surface, open back $4.05
Nickel Plate Surface:
No. 1001 Nickel Plate, Single Surface $3.60
Glass Surface:
Glass King, Single Surface, open back $3.95
Enamel Surface:
Enamel King, Single Surface, ventilated back..... $3.95

Washers—Leather, Axle—

Solid ..... 80&10@90%
Patent ..... 90@90&5%
Coil: ⅞ 1 1⅛ 1¼ Inch. 10½¢ 11½¢ 12½¢ 16¢ per box

Iron or Steel—

Size bolt.... 5-16 ⅜ ½ ⅝ ¾
Washers....$5.90 5.00 3.70 3.50 3.30
The above prices are based on $5.50 off list.
In lots less than one keg add ½¢ per lb.; 5-lb. boxes add ½¢ to list.

Cast Washers—

Over ⅛ inch, barrel lots..... per lb. 1¾@2¢

Wedges—

Oil Finish.....lb., ..@3¢

Weights—Hitching—

Covert Mfg. Co..... 30&2%

Sash—

Per ton, f.o.b. factory:
Eastern District..... $30.00
Southern Territory. $24.00@25.00
Western and Central Districts ..... $25.00@28.50

Wheels, Well—

8-in., $1.55; 10-in., $2.00; 12-in., $2.50; 14-in., $4.00.

Wire and Wire Goods—

Bright and Annealed:
6 to 9..... 72¢&10&7½%
10 to 18..... 72½¢&10&10%
19 to 26..... 75¢&10¢&10&2½%
27 to 36..... 77½¢&7½%
Galvanized.
6 to 9..... 72½¢&10%
10 to 14..... 72½¢&10&5%
15 to 16..... 72½¢&10&5%
17 to 18..... 72½¢
19 to 26..... 70¢&5&2½%
27 to 36..... 65¢&10&10%
Coppered:
6 to 9..... 65¢&10&10%
10 to 14..... 70¢&10&5%
15 to 18..... 65¢&10&10%
19 to 26..... 70¢&5&2½%
27 to 36..... 72½¢&10&2½%
Tinned:
6 to 18..... 67¢&10&10%
Brass..... 24¢ *lb., base*
Copper ..... 32¢ *lb., base*
Cast Steel Wire..... 30%

Spooled Wire—

Annealed and Tinned.. 65&10@70%
Brass and Copper..... 45&10%
Retailers' Assortments, per box, 2.50@3.50

Wire Clothes Line, see Lines.
Wire Picture Cord, see Cord.

Bright Wire Goods—

Steel Wire Goods..... 90&15%
Brass Wire Goods..... 90%
Brass Cup and Shoulder Hooks, 80&15%

Wire Cloth and Netting—

Galvanized Wire Netting.. 80&5%
Painted Screen Cloth, 100 ft., $1.35
Standard Galv. Hardware Grade: Per 100 sq. ft.
Nos. 2, 2½ & 3 Mesh..... $3.40
Nos. 4 and 5 Mesh..... $3.65
No. 6 Mesh..... $3.90
No. 8 Mesh..... $4.40

Wire, Barb—See *Trade Report*

Wrenches—

Agricultural ..... 75@75&10%
Alligator or Crocodile.. 70&10@75%
Baxter Pattern S Wrenches... 70&5@70&10%
Drop Forged S..... 45@45&5%
Acme ..... 60&10%
Alligator Pattern, 70%; Bull Dog..70%
Bemis & Call's:
Adjustable S, 40%; Adjustable S Pipe, 40%; Briggs Pattern, 40%; Combination Bright, 40%.
Steel Handle Nut..... 50%
Combination Black..... 40&5%
Merrick Pattern..... 50%
Boardman's 40%
Coes' Genuine Knife Hdl..40&10&5&5%
Coes' Genuine Steel Hdl..40&10&5&5%
Coes' Genuine Key Model..40&10&5&5%
Coes', Genuine Hammer Handle..... 40&10&5&5%
Coes' "Mechanics'"....40&10&10&5&5%
Donohue's Engineer..... 40&10%
Eagle 70%
Gem Pocket..... 50%
Hercules 70%
W. & B. Machinist:
Case lots..... 50&5%
Less than case lots..... 50%
W. & B. Railroad Special:
Case lots..... 50%
Less than case lots..... 40&10&5%
Solid Handles, P., S. & W., 50&10%; full cases..... 50&10&5%
Stillson 65%
Uwanta Wrench Co.:
Railroad Special, Iron Handle, 40&10&5%
Other Wrenches..... 50%
Vulcan Chain..... 50%

Wrought Goods—

Staples, Hooks, &c., list March 17, '92..... 90%

Zinc—

Sheet.....per 100 lb., $8.35@$8.60

For the Table of "Current Metal Prices" see the First Issue of Every Month.